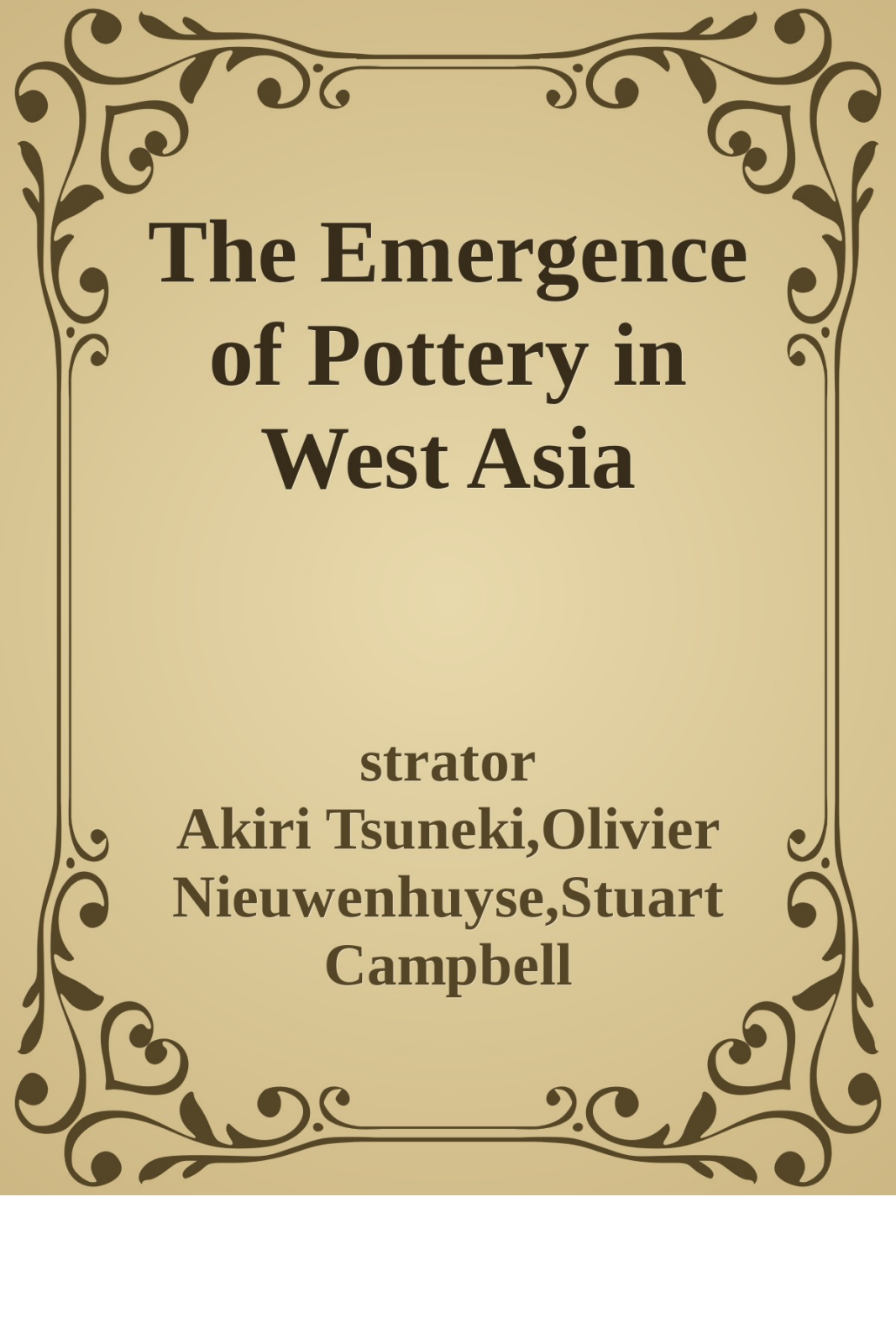


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The Emergence of Pottery in West Asia

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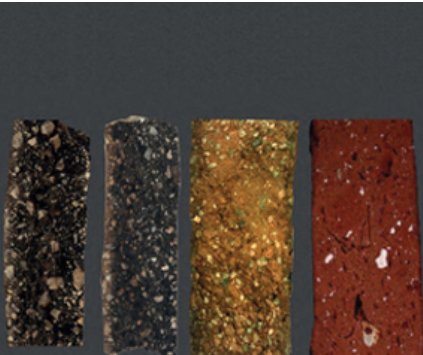
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THE EMERGENCE OF POTTERY

— in West Asia —



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Front cover images:

Top row: (Left) Kerkh Ware, Tell el-Kerkh 2; (Right) Pottery sections showing inclusions in early Mesopotamian ceramics (from left Akarçay Tepe, Akarçay Tepe, Tell Seker al-Aheimar, Tappeh Sang-e Chakhmaq).

Middle row: (Left) light coloured pottery with black mottles, Salat Camii Yanı; (Right) red-on-buff painted pottery, Tappeh Sang-e Chakhmaq.

Bottom row: Examples of complete pottery vessels from the Proto-Hassuna phase from Tell Seker al-Aheimar (Left) unpainted pot, (Middle) large storage vessel in situ. (Right) decorated ceramics from the Initial Pottery Neolithic levels, Tell Sabi Abyad.

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Preface

This book is a monograph which follows the international symposium on 'The emergence of pottery in West Asia: the search for the origin of pyrotechnology', which was held at the University of Tsukuba, Japan, on 29 and 30 October, 2009. This symposium was the first serious meeting to discuss the Neolithic pottery of this region by pottery experts. A corresponding symposium was held for the Japanese public by the same participants at the Ancient Orient Museum in Tokyo on November 1, 2009.

Since the late 1990s, the typology and stratigraphy of the 'earliest pottery' had increasingly been reported from Neolithic sites in West Asia. Most of the pottery was discovered in cultural layers just above the pre-pottery layers, and looked to be from the oldest ceramic industry in West Asia. Therefore, based on the increasing quantity of new evidence, it seemed a good time to hold a discussion about the emergence of pottery in West Asia and to produce a new synthesis.

It was decided to contact colleagues who had been engaged in the excavation and study of pottery at these sites. As several sites were under excavation by Japanese colleagues, Tsukuba was an obvious location for a symposium. One of the editors of this volume (A.T.) applied for an international meeting grant from the Japan Society for the Promotion of Science, and this application was accepted. As the symposium would be held in Japan, which has produced some of the earliest pottery in the world, we thought a comparative study of the emergence of pottery in the two regions (West Asia and Japan) would contribute to further understanding of why pottery appeared and developed differently in West Asia. This was the reason why we invited Prof. Yasuhiro Taniguchi, one of the leading scholars of the Jomon culture and pottery of Japan.

We were grateful for the efforts of all the scholars and students who attended the symposium and who gave presentations and offered suggestions on the earliest pottery. The grant from the Japan Society for Promotion of Science which facilitated this symposium was greatly appreciated. Bronwen Campbell was of great help in copy editing the contributions and Hannah Plug provided valuable proof reading assistance.

As we discuss in the main text, there are many reasons why we must investigate the emergence of pottery in West Asia. The region has a long history of ceramic production and appears to be one of the places in which the origins of pottery can be identified. We can also look to ceramic production as the root of many other critical technologies that also emerged in the region, such as metallurgy and glass-working. In the development of pyrotechnology, the invention of pottery in West Asia was an epoch-making event in human history. It signifies the beginning of genuine pyrotechnology.

At the symposium, each participant introduced the earliest pottery from their respective sites. Some scholars showed not only slides of the 'earliest pottery' but also displayed artefacts themselves. We exchanged information on attributes of this 'earliest pottery', such as form, size, color, firing, paste, temper, decoration and surface treatment. We believe that sharing these attributes openly contributes to further understanding of the emergence and usage of the first pottery in West Asia.

The following themes were discussed: 1) date of appearance, 2) attributes, 3) function and 4) social innovation. To a certain extent, a consensus was reached for the emergence of pottery in West Asia, as you will see in the main text, although many new questions were also raised.

There were plans to publish the results immediately after the symposium. However, due to the negligence of the editors, several years have passed. We must sincerely apologize to the participants who have waited a long time since contributing their papers. If some papers lack the very latest knowledge and bibliography, it is the editors' fault. However, recent tragic conflicts in Syria and Iraq have prevented new archaeological investigations and the 'earliest' pottery mentioned in this book remains still the 'earliest' in almost all cases. Therefore, we believe that this book contributes to the study of early pottery in West Asia.

Finally, we must mention the reason for the use of the term 'West Asia' instead of the 'Near East' in the symposium and in this book, to describe the regions where we have been engaged in research. This is partly because of the location of the symposium and partly because of the academic stance of one of the editors (A.T.). There is a hint of Eurocentrism in the term 'the Near East', and West Asia is not the Near East but the Near West (or maybe even the Far East) from the perspective of Japan, the locale of this symposium. Therefore, in this book and in the symposium, we use the geographical term, West Asia.

Akira Tsuneki
Olivier Nieuwenhuyse
Stuart Campbell

Chapter 1

The Significance of Research on the Emergence of Pottery in West Asia

Akira Tsuneki

Introduction

The invention of pottery signifies the beginning of genuine pyrotechnology, the most important technological innovation in human history and one that formed the basis of modern industrial technology (e.g. Childe 1951: 76). Without understanding the origins of pottery, we cannot have a clear picture of other technological innovations, such as the metallurgy of copper, bronze, iron and nonferrous metal, or glass working and fine ceramic production. It is clear that these technological innovations went hand in hand with social advancement. Therefore, to provide a complete sketch of human history, we need to consider pottery's emergence as an initial technological advance.

This important series of technological innovations did not occur everywhere that pottery appeared. The emergence of pottery in West Asia lagged a few millennia behind East Asia (e.g. Aikens 1995; Taniguchi in this volume) and other regions, such as the south Sahara and Nile Valley (e.g. Close 1995; Jess 2003). However, once pottery was invented, the creation of pottery kilns followed within a few centuries in West Asia (e.g. Merpert and Munchaev 1973, 1993a; Tsuneki 2004: 213–221). Subsequently, many cutting edge technologies such as metallurgy and glass-working followed one after another. Technological progress after the emergence of pottery in West Asia was striking. If we compare this process in East Asia and other regions, where pottery appeared much earlier but pyrotechnology developed less rapidly, the differences in speed and substance become more apparent.

Therefore, studying the emergence of pottery in West Asia does not merely focus on the origins of pottery production in this region. Instead, it focuses on the origin of pyrotechnology that formed the technological foundations for all human civilizations until today.

Researching the origins of pottery in West Asia

The long pre- and proto-history of pottery production in West Asia is a key point when we consider the emergence of this technology in that region. Archaeologists have focused on various aspects of the emergence of pottery in West Asia. Some scholars have discussed its similarities to other technologies. For example, Amiran (1965) considered the similar processes used in making both bread and pottery, asserting that the technological development of bread-making accelerated the establishment of pottery-making. Vandiver (1987) pointed out that the technological development of clay architecture together with firing techniques produced the first pottery.

It is true that kneading, shaping, and baking processes are common between bread- and pottery-making and clay was an indispensable material for making ovens to bake bread. Clay has always been the primary raw material for making pottery and its usage as an architectural material in West Asia has been a tradition since the Epi-Paleolithic. Sedentary lifestyles accelerated the use of clay for the exterior, interior and furnishing of buildings.

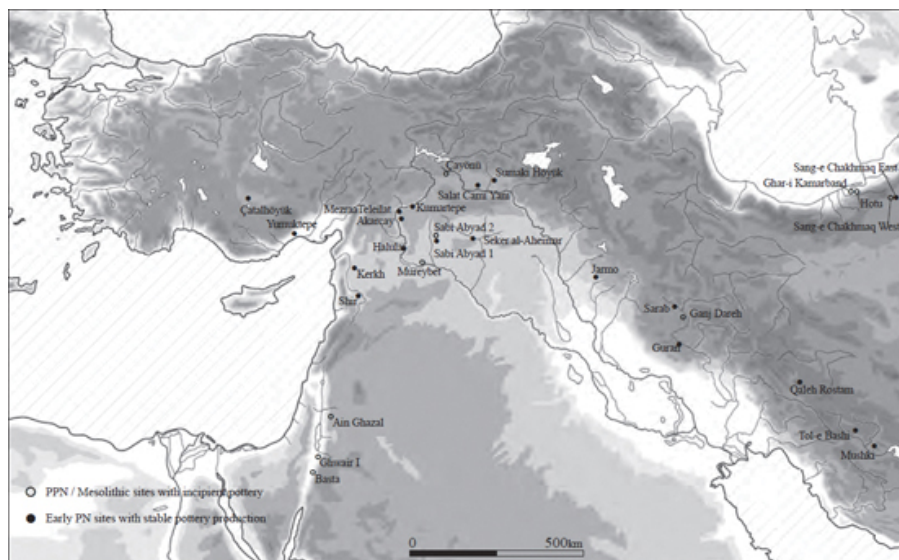


Fig.1.1 Distribution of PPN Sites with incipient pottery and Early PN sites with sustained pottery production.

Clay usage increased and spread quickly during the Natufian and Pre-Pottery Neolithic in West Asia in conjunction with the establishment and expansion of sedentary life.

In the Pre-Pottery Neolithic, clay was not only limited to architectural uses like pisé, sun-dried mud bricks and mud plaster, but it was also used for making figurines, tokens, beads, spindle whorls

and vessels. Schmandt-Besserat (1974; 1977a, b) summarized a history of clay usage before pottery. Some of these small objects were clearly burnt by firing. Therefore, a few thousand years before the starting of Pottery Neolithic, the people of West Asia knew that 'the clay becomes hard when it is burnt'.

Some archaeologists would like to find candidates for the prototype for pottery in order to understand the emergence of pottery. Before the Pottery Neolithic, vessels made from stone, wood, skin and basketry had been used in West Asia. For example, Mortensen (1992) would like to identify traces of basketry in the painted pottery patterns in Iran. Childe (1951: 89) suggested that pottery might have originated from the accidental burning of a basket plastered with clay. Actually, bitumen-coated basket fragments were discovered in many Pre-Pottery Neolithic sites, suggesting that basketry is a candidate for the prototype for pottery.

However, the most noticeable vessels connected with the beginning of pottery were made from plaster, so-called white ware (*vaisselles blanches*). These appeared before the end of the Pre-Pottery Neolithic B (PPNB). Plasticity of the materials and the unique firing process employed are common attributes to both white ware and pottery production. Miyake (1996) suggested that the emergence of pottery was closely connected with the development of white ware. He stated that there were originally two types of white ware. In the Levant, it was made of limestone and shapes mainly consisted of plain and pedestal bowls. However, white ware from the Jazirah and north Mesopotamia was made of gypsum. This gypsum white ware mainly consisted of deep bowls, which were modelled using baskets. Miyake asserted that these two different types of white ware correspond with different types of the The Significance of Research on the Emergence of Pottery in West Asia earliest pottery in the Levant and north Mesopotamia (*ibid*). Although his idea is provocative, the size, forms and other attributes of white ware differ from the earliest pottery in these regions.

Therefore, even the most probable prototype candidate, white ware, does not seem to be the direct precursor of genuine pottery. Even if we can identify a pottery prototype, these evolutionary approaches can merely explain some of the necessary conditions for the appearance of pottery. However, they do not help us understand why and how pottery appeared. Moreover, the first pottery in West Asia appeared simultaneously with or earlier than the above mentioned prototype candidates. Instead of searching for these candidates, we

must evaluate the early pottery itself.

When did pottery appear in West Asia?

There are many debates about the earliest pottery in West Asia. As will be mentioned below, some consensus has been reached that practical and stable pottery production started at the beginning of the Pottery Neolithic, around 7000 cal. BC in West Asia (e.g. Aurenche et al. 2001; Le Mière and Picon 1999; Campbell, this volume). However, it is also true that 'pottery' has been reported from many Pre-Pottery Neolithic sites.

One of these types of 'pottery' from the Pre-Pottery Neolithic involves miniature clay vessels. For example, the sites of Mureybet IIIA (Cauvin 1974: Fig. 1; Le Mière and Picon 1999: Fig. 3), Jericho (Kenyon and Holland 1983: Fig. 367-1), Beidha VI (Kirkbride 1966: Fig. 4-4), and Ganj Dareh D (Smith and Crepeau 1983) produced such items. All of these artifacts, except those at Jericho, were discovered in the context of burnt layers, and we cannot confirm if they were originally unbaked or intentionally burnt clay vessels. The example from Jericho might be a small unbaked clay vessel. Even if they were genuinely fired, these vessels could not be used for practical purposes because their sizes and volumes are quite limited. The vessel shapes differ and we cannot discern any standard varieties. Therefore, we conclude that these types of pottery played no clear roles in Pre-Pottery Neolithic societies, even if they had some symbolic meaning. In summary, they should not be called genuine pottery.

Another 'pottery' type in Pre-Pottery Neolithic societies consists of large clay vessels, sometimes called bins. These were large built-in clay vessels with a lot of chaff temper. Many Pre-Pottery Neolithic buildings contained clay bins, which must have been popular facilities, especially during the PPNB. For example, we can mention a large clay vessel at Ain Ghazal (Rollefson et al. 1992: Fig. 13); a dug-out earthen basin lined with a coat of marl or lime-rich earth (Garstang and Garstang 1940: 54) and large clay basins sunken into floors at Jericho (Kenyon 1957, 1960); a large clay vessel at Basta (Nissen et al. 1987: 109); and many clay bins and large vessels at Ganj Dareh level D (Smith 1972, 1975, 1990). The report on Tell el-Kerkh (Odaka, this volume) introduces one such clay bin discovered in the late PPNB layer. According to their attributes (size, thickness, shape and depth), these large clay vessels/bins must have been used mainly as storage containers. Most of them were discovered in the context of burnt layers, but we cannot confirm whether or not they had been intentionally burnt. A series of Tell el-Kerkh clay bins were also

discovered in the context of a burnt house. When we compared them with the early genuine pottery of Tell el-Kerkh in the following Pottery Neolithic layers, all attributes such as size, form, wall thickness, paste, surface treatment and probable function are completely different. They had been unbaked and would not hold water. Therefore, we may not call them 'pottery' either.

Besides miniature and large clay vessels, we have some other evidence of 'pottery' from Pre-Pottery Neolithic sites. Based on attributes such as size, form, wall thickness, paste and surface treatment, these items can undoubtedly be called genuine 'pottery.' Several examples exist, including: crude pottery fragments from the Middle PPNB at Ain Ghazal (Rollefson and Simmons 1985: 44, Rollefson et al. 1992: 459); fibre and coarse grit tempered potsherds from the PPNB at Basta (Nissen et al. 1987: 109); a few dozen thick, crude, and friable potsherds from phase III (Middle PPNB) at Ghwair I (Simmons and Najjar 2006: 89); a few mineral tempered sherds from level 2 of Sabi Abyad II (Nieuwenhuyse, this volume); a very limited number of potsherds from final PPNB layers at Halula and Akarçay (Cruells, this volume); thick potsherds from aceramic occupations at Çayönü (Ozdogan and Ozdogan 1993: 95); a single sherd with incisions from level E and chaff-tempered potsherds from level D of Ganj Dareh (Smith 1974: 207; 1978: 539; Bernbeck, this volume); lightly-fired, chaff-tempered, soft-ware potsherds from the Mesolithic and/or aceramic Neolithic levels at the Gar-i Kamarband and Hoto caves (Coon 1951, 1954, 1957; Gregg and Thornton 2012); and red-washed, chaff-tempered potsherds from West Tappeh level III of Tappeh Sang-e Chakhmaq (Tsuneki, this volume). It is clear that these examples were originally fired and could be used as receptacles to carry liquids; in other words, they had all of the attributes of genuine pottery. The only point in dispute is that they were discovered in Pre-pottery Neolithic layers.

Therefore, we can conclude that pottery production in West Asia began as early as the PPNB. We tentatively call these PPNB examples 'incipient pottery.' However, when we compare incipient pottery production with that of the later Pottery Neolithic, the differences in quantity and stability are conspicuous. Most PPNB sites do not produce potsherds. If they do produce them, the number of incipient pot sherds from excavations is very small in number. Most of them were discovered as fragmented pieces. On the other hand, the quantity of pottery from excavations at Pottery Neolithic sites is large and ubiquitous, allowing us to easily reconstruct their shapes. Therefore, it is true that incipient pottery was genuine from the technological

viewpoint, but they played no important role as practical items in society. In this regard, the term Pre-Pottery Neolithic is a reasonable one for these societies.

Therefore, we can state that regular, stable pottery production started at the beginning of Pottery Neolithic in West Asia. As Campbell discusses in detail in his chapter (this volume), dates for the beginning of the Pottery Neolithic in each region fluctuate by several hundred years around 7000 cal. BC. Although we estimate that these fluctuations are quite large, we cannot help but consider that Pottery Neolithic societies in each region exchanged their ideas on making pottery.

As this volume makes clear, the attributes of early potteries in the phase of stable pottery production from the Pottery Neolithic are generally common and similar on an inter- and intraregional scale. Therefore, if we can summarize and compare the characteristics and attributes of early, regular pottery in each region, we can better address the questions of how and why this practical, regular pottery appeared in West Asia.

How was early pottery used in West Asia?

Evaluating the emergence of pottery in West Asia requires the reconstruction of its use. The fundamental attributes of incipient pottery are varied and their distributions are sporadic. Moreover, most examples were fragments and, until recently, we knew little about their contexts of discovery. Based on their states, they do not seem to have been practical items in Pre-Pottery Neolithic societies of West Asia. Instead, pottery likely played various but undefined functional roles in this incipient and experimental phase. Therefore, we focus on the function of early pottery in the phase of stable pottery production from the Pottery Neolithic.

Although pottery can be used as non-practical objects for display, ritual or other symbolic purposes, the main function is as a container. The general functions of pottery containers were storage, processing, tableware and transportation of goods.

The use of storage vessels for water, foodstuffs like cereals or other items was a fundamental function of regular pottery. Moore (1995: 47) summarized early pottery uses in West Asia and asserted that the coarse wares may have been used to store foodstuffs such as grains and pulses. Atalay and Hastorf (2006: 310) thought that the earliest pottery at Çatalhöyük was used to store animal fats rather than for presentation or cooking. Such discussion of pottery use has been based

on the development of farming and herding societies. However, the appearance of pottery at the beginning of the Pottery Neolithic in West Asia does not correspond well with these functions for two reasons. Firstly, early regular pottery mainly consists of small- to medium-sized elaborated bowls (see papers in this volume). Large coarse pottery jars were scarcely seen at the beginning of the Pottery Neolithic. Another reason involves the existence of large built-in clay vessels/bins in PPNB and early Pottery Neolithic settlements. Storage facilities in houses were mainly provided by large clay or plaster vessels/bins in these periods. Larger pottery jars for storage only appeared among assemblages. The Significance of Research on the Emergence of Pottery in West Asia in the next phase of the Pottery Neolithic. Therefore, archaeologists today tend to believe that storage was not the main function of regular pottery at the beginning of the Pottery Neolithic.

Food processing might have been a primary function of early regular pottery. Numerous archaeologists discuss the appearance of pottery from this viewpoint (e.g. Matson 1965; Amiran 1965; Moore 1995: 47; Taniguchi, this volume). Food processing technology, especially boiling food in a vessel, provided innovative advantages for human societies. People could consume much wider varieties of food by cooking this way. Archaeologists have looked for evidence of cooking in early pottery vessels. Some scholars have found traces of soot on the sides of pottery (e.g. Moore 1995: 47), but others have argued that there is no proof that early pottery was used for cooking (e.g. Haaland 2007: 176). All attributes of early pottery must be examined carefully for further discussion on this issue.

If the first pottery in the phase of stable pottery production was mainly used for cooking, this raises questions about what types of foods Pottery Neolithic people cooked. Many scholars have tackled this subject, suggesting a variety of things such as “gruels or mush” (Matson 1965: 205), “cereal porridges” (Molleson et al. 1993), “animal fats” (Copley et al. 2005), “fermentation and brewing of wine and beer” (Katz 2003) and “processing of dairy foods” (Gregg 2010). All of these suggestions are fascinating and stimulating, and each hypothesis has been tested using various analyses, including chemical residues. For example, Gregg hypothesized that the invention of pottery by highly mobile pastoralists facilitated the widespread adoption of a new subsistence strategy based on herding sheep and goats throughout West Asia (Gregg 2010:1). He tested this supposition by obtaining direct evidence of the function of early pottery vessels for the collection of milk and the processing of dairy foods. Although

he recovered organic residues from this early pottery, he found no conclusive proof to substantiate his hypothesis. He concluded that early pottery in West Asia was used for a variety of purposes, including milk processing, cooking of meats/extraction of marrowfats through boiling, cooking of cereal grains or pulses in a porridge or gruel, and bitumen transportation (ibid: 57–58).

Use as tableware is another possibility, especially considering the size and shapes of early regular pottery. Such usage has been discussed especially in ritual or festival contexts among complex societies. Hayden suggested that the social importance of early pottery was linked to feasting (Hayden 1995: 260–261). Twiss applied this idea to the incipient pottery discovered from southern Levantine PPNB sites and asserted that clay pots might have been attractive to feasters (Twiss 2008: 428–429). According to Banning (2003: 1) early pottery technology in the southern Levant probably involved food distribution, consumption and enjoyment, since most of the earliest pottery consists of cups, bowls, and decorated wares. Although these ideas are appealing, we lack sufficient evidence from southern Levantine PPNB sites to reconstruct such kinds of pottery shapes and, in turn, their functions.

Transportation of goods is another possible function. Although bitumen-coated basket fragments were discovered from a wide range of Pre-Pottery Neolithic contexts in West Asia, very few early potsherds have bitumen adhering to their interior surfaces (Gregg 2010: 8). In fact, very little evidence exists on the use of pottery for transporting bitumen or other materials. When we consider the attributes of early pottery in West Asia, it is difficult to imagine it was invented for transportation of goods.

Toward a consensus on the emergence of pottery in West Asia

In the last two decades, examples of the ‘earliest ware’ have been discovered one after another from sites located in northern Syria and southeastern and central Anatolia. We can mention sites such as Tell el-Kerkh in the northern Levant; Yumuktepe in Cilicia; Akarçay Tepe, Mezraa-Teleilat, and Tell Halula in the middle Euphrates; Tell Sabi Abyad in the Balikh Valley; Tell Seker-al-Aheimar in the Khabur Valley; Salat Cami Yanı and Sumaki Höyük in the upper Tigris; and Çatalhöyük in central Anatolia (Fig. 1.1). These sites produced pottery that was earlier than the ‘earliest pottery’ known at the time in each region, such as Dark-faced Burnished Ware (Amuq A pottery) or Coarse Chaff-tempered Light-Colored Ware (Proto-Hassuna pottery). The attributes of earlier pottery differ significantly from this ‘earliest

pottery'. Most of earlier ceramics were discovered from stratigraphic layers just above the last phase of the PPNB in each site and can thus be regarded as the earliest practical pottery in each region. They have various names, such as Kerkh Ware (Tsuneki and Miyake 1996), Sandy Ware (Balossi 2004), Série Noire/Black-series (Faura and LeMière 1999) and Pre-Proto-Hassuna Ware (Nishiaki and LeMière 2005).

At the same time, pottery from older excavations, whose attributes are similar to those of newly discovered early ceramics at the beginning of the Pottery Neolithic, have been re-examined. For example, the pottery from Kumar Tepe in the middle Euphrates was re-examined by Le Mière and Picon, among which they identified the "Série Noire" (Le Mière and Picon 2003).

Neolithic sites in the Zagros region have not been fully investigated over the last two decades because of political turmoil. However, old excavations and a few new ones indicate that many important Neolithic sites are yielding incipient and early pottery in this region. Therefore, these ceramics must also be included in any discussion of the emergence of pottery in West Asia.

In order to reach a consensus on the emergence of pottery in West Asia, we must return to the starting point, the early examples of pottery themselves. We must observe their numerous attributes carefully. Are they mineral- or chaff-tempered? Are they plain or decorated? What are their shapes, sizes and colours? Are their surfaces burnished or smoothed? We can then reconsider these attributes for a comparative study and evaluate which ones are common or infrequent among the early ceramics. I believe that such thorough research will provide insight on when, how, and why people began producing pottery as a necessary element of life in West Asia.

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Chapter 2

The Earliest Pottery of West Asia: Questions Concerning Causes and Consequences

Marie Le Mière

Introduction

If the earliest pottery in West Asia is examined in the general context of the beginning of pottery fabrication in the world, the very early pottery found in eastern Asia, China, Japan and eastern Siberia, dating back to 17,000–15,000 BP (Taniguchi, this volume; Jordan and Zvelebil 2009b: 70) must be mentioned. The date of the earliest pottery in West Asia, around 7000 cal. BC (Campbell, this volume) thus raises questions concerning its origin: was this new material developed in West Asia or was it imported from those eastern regions? Although a diffusion through northern Eurasia has been proposed (Jordan and Zvelebil 2009a), no argument has yet been put forth concerning such diffusion through southern Eurasia and in particular West Asia. As to a possible importation of pottery-making technology from the northern Sahara, where the earliest pottery is dated to around 9000 cal. BC (Close 1995: 24), the late appearance and development of pottery in the southern Levant, according to the evidence so far, makes this hypothesis unlikely. Thus an independent development of this technique in West Asia can still be proposed.

Early pottery in Western Asia

The context of the appearance of pottery in West Asia is very particular. In many regions of the world, pottery was developed by hunter-gatherer societies long before the beginning of agriculture; in others, it was part of the Neolithic package, strongly associated with the beginning of agriculture. In West Asia the emergence of pottery occurred at the end of Neolithisation, in sedentarised communities, more than a millennium after the development of agriculture and much later than animal domestication, when the technology necessary to make pottery had already been long developed, particularly the tempering of clay and firing at high temperatures (Le Mière and Picon 1998: 9–10). Thus there appears to be no direct connection between

the appearance of pottery and the Neolithisation process, and none with agriculture.

West Asia covers a very large area and the data concerning the earliest pottery are still quite scarce and not evenly distributed (Fig. 2.1).

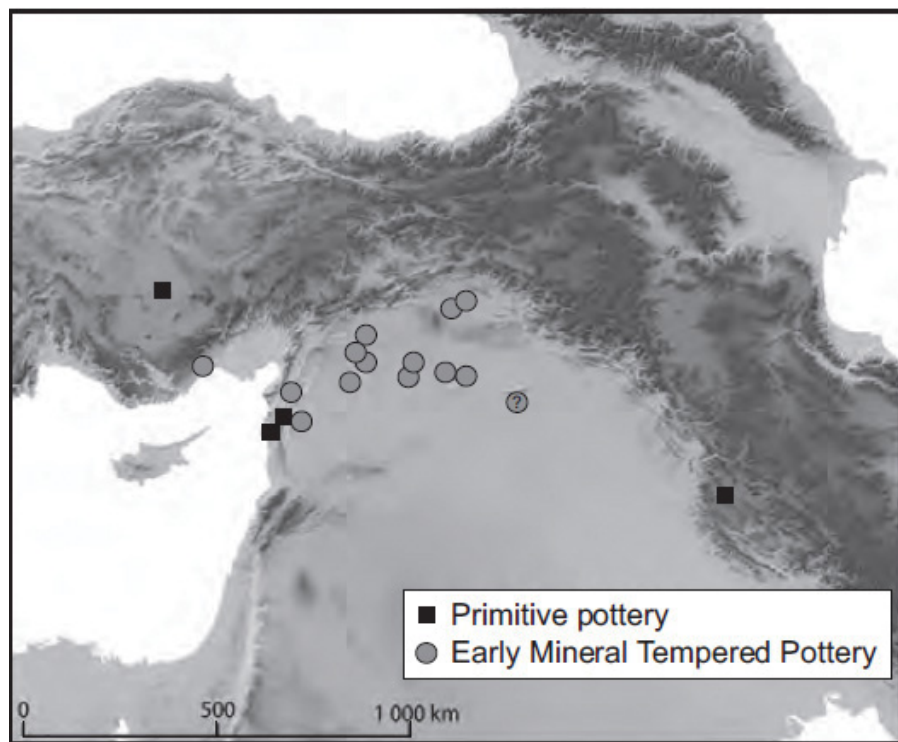


Fig.2:1 Distribution of the earliest pottery sites in West Asia: a broad, scattered distribution of the so-called 'primitive' pottery sites in comparison to the restricted, dense distribution of the early mineraltempered pottery sites.



Fig.2.2 Colours of early mineral-tempered pottery, mainly dark, although some light colours do occur. 1: Tell Damashliyya; 2: Mezraa Teleilat; 3: Akarçay Tepe; 4–5: Tell Seker al-Aheimar.



Fig.2.3 Burnishing, a characteristic surface treatment of early mineral-tempered pottery. 1 and 3: Kumartepe; 2: Tell Seker al-Aheimar.

A few sites dated to around 7000 cal. BC present a continuous sequence of pre-pottery and pottery levels and have provided pottery which is technologically rather 'primitive' (Le Mièrre and Picon 1998: 11–12). These sites are widespread in West Asia, from the western Zagros (Tepe Guran) to the northern Levant (Tell el Kerkh and Ras Shamra) to central Anatolia (Çatal Hüyük) (Fig. 2:1). The 'primitive' characteristics of this pottery are diverse: at Tepe Guran (Mortensen 1963) the earliest pottery is described as coarse and coarsely formed, grey-brown or dark grey in colour, possibly due to a low firing; at

Çatalhöyük (Mellaart 1964 and 1966), where most of the earliest pottery is plant-tempered and very thick, a group of sherds that are friable and brown in colour also suggest a low firing temperature; at Tell el-Kerkh (Miyake 2003) and Ras Shamra (de Contenson 1992) one of the earliest wares is heavily plant-tempered, which makes it very porous and brittle. These diverse so-called ‘primitive’ wares, always scarce, were to disappear soon after, which also indicates that they were perhaps not considered to be successful, the elaboration of the technique being still in progress.

At the same time, around 7000 cal. BC, a series of sites presents a continuous sequence of pre-pottery and pottery levels: the earliest pottery at these sites is also very scarce at first although it is not ‘primitive’, but technically quite elaborated. Its distribution is restricted to the Jezirah and the northern Levant/Cilicia (Fig. 2.1), and although extremely homogeneous has been given a variety of names (Le Mièvre 2013). Names such as “Black Series” (Faura and Le Mièvre 1998: 283), “Early Dark Ware” (Nishiaki and Le Mièvre 2005: 61) and “Early Mineral Ware” (Nieuwenhuyse et al. 2010: 77) suggest some of its characteristics. This pottery is described in detail site by site in the next chapters of this book. We will only present its main characteristics here to introduce the several questions raised.

Properties of the early pottery

As mentioned above, the quantity of pottery found in the earliest levels was sometimes so small that those levels were first considered to be pre-pottery.



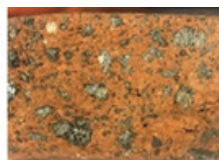
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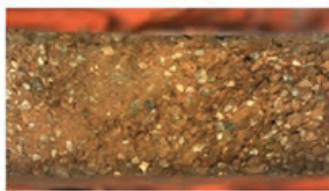
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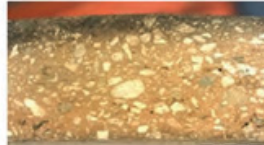
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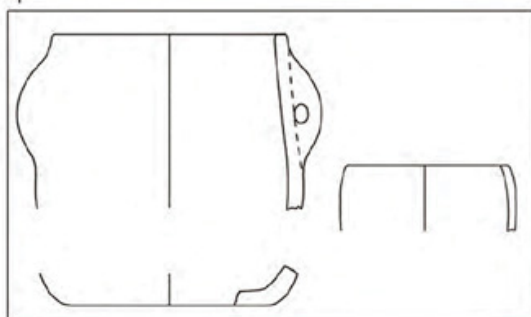
Fig.2.4 Mineral temper of the early mineral-tempered pottery. Crushed calcite, 1: Akarçay Tepe (after Özbaşaran and Molist 2007), 2: Kumartepe. Volcanic minerals, 3–7: Tell Seker al-Aheimar.



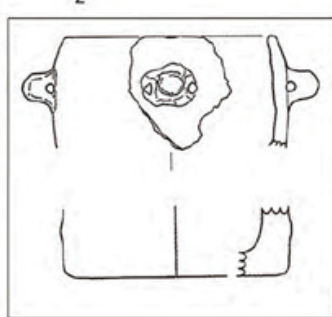
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Fig.2.5 Shapes of early mineral-tempered pottery. 1: Kumartepe; 2: Akarçay Tepe (after Özbaşaran and Molist 2007); 3: Tell Seker al-Aheimar; 4: Salat Camii Yanı (after Miyake 2011: fig. 7).



1



2

Fig.2.6 Decoration of early mineral-tempered pottery. 1: Tell Sabi Abyad (after Nieuwenhuyse et al. 2010: fig. 6); 2: Tell Seker al-Aheimar.

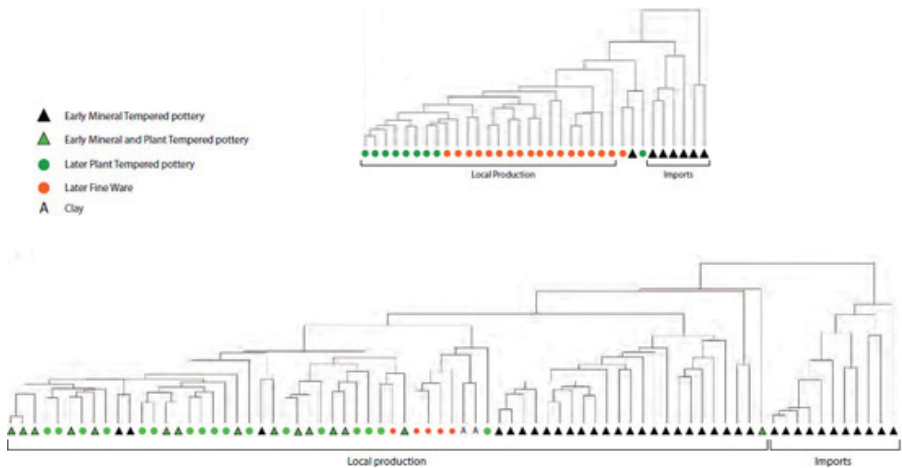


Fig.2.7 Examples of early mineral-tempered pottery imports: dendrograms of the chemical composition of the pottery from Tell Damishliyya (above) and Tell Seker al-Aheimar (below). At Tell Damishliyya the sample is too small to clearly evidence a local production of early mineral-tempered pottery.

Whether this represented the beginning of the technique or the beginning of the use, in both cases a small quantity fits well with a beginning.

This pottery is commonly dark in colour, although lighter colours also occur (Fig. 2.2). The dark colour is probably due to technical reasons, and because a very early mastery of firing temperature is demonstrated, it could be due to an actual choice (Le Mière et al. in press).

This early pottery is the most often burnished. This surface treatment is more systematic in the earliest levels, where pottery is

particularly well made with extremely even surfaces (Fig. 2.3). This is one of the elements which refutes the so-called 'primitive' character of early pottery from the Jezirah and the northern Levant. Burnishing helps to make the pottery watertight, which could be related to the function of this pottery.

Together with colour, the mineral temper is a striking characteristic of the earliest pottery of Jezirah and the northern Levant (Le Mièrè 2009); unlike the so-called 'primitive pottery' mentioned above, it is exclusively mineral-tempered (Fig. 2.4). For this reason it will be further designated as 'early mineral-tempered pottery'. The minerals used differ from site to site as well as within each site, in particular crushed calcite and volcanic minerals, that is basalt and/or volcanic carbonates. Whatever the type, this temper is highly variable in quantity, frequently very abundant, and also variable in size, very large fragments (>5 mm) being common. Although some of this temper could be naturally present in the clay, some of it was clearly added, not only calcite but basalt as well.

The shapes are very simple (Fig. 2.5), being mostly closed, less frequently vertical and never open. The closed shapes are of the hole-mouth type, without any neck. Lugs are quite frequent from the beginning. These shapes are typical cooking-ware shapes, found in all periods, not only the Neolithic.

Decoration is quite rare, so far only painted examples have been found (Fig. 2.6); it does not appear in the very earliest levels.

Provenance studies

An unexpected characteristic of the early mineral-tempered pottery was revealed by chemical analyses, which suggest that some of this pottery was very probably imported at 8 of the 10 sites submitted to chemical analysis (Fig. 2.7). When the sample analysed is large enough, besides the imports, a local production of early pottery is evidenced at all sites except one. The later development of the early mineral-tempered pottery in the Jezirah should be mentioned; plant temper was introduced, at first mostly used together with mineral temper. The ware containing both mineral and plant temper, when analysed, has proved to be a local production.

One of the main features of the early mineral-tempered pottery is its complete disappearance, at least on several sites, and its very strong decrease on others. This is particularly striking as some of this pottery was imported, but some of it was locally made. The disappearance of imported pottery could have occurred for various reasons not related to the pottery itself. But the disappearance of pottery which people

made an effort to develop themselves or through imitation of imported examples is more puzzling. Technical reasons could have played a role in this phenomenon, such as the heavy weight of basalt-tempered pottery or the difficulty of making crushed-calcite-tempered pottery, which requires accurate control of the firing temperature.

Discussion

It has been stated that for most of West Asia our knowledge concerning the earliest pottery is very limited, whereas the earliest pottery of the Jezirah and the northern Levant provides a fairly consistent set of data (Le Mière 2013). However, in spite of this consistency, this pottery raises many questions, of which origin and use in particular will be considered.

Many characteristics of the early mineral-tempered pottery demonstrate its suitability for cooking (Le Mière and Picon 2003; Le Mière 2009). First of all, the temper is abundant and large in size. Crushed calcite is particularly suggestive, as it has a long tradition of being used to make cooking ware in the Mediterranean area, as early as the Iron Age, and is still used today. Closed shapes with handles and burnishing are also characteristic of this cooking ware. But the fact that early mineral-tempered pottery completely disappears, at least on several sites, raises questions concerning its use as cooking ware on the sites where it has been found so far, and concerning the changes in dietary habits suggested. In Upper Mesopotamia, the so-called Proto-Hassuna area, it disappears completely; during the Proto-Hassuna and Archaic Hassuna periods no types of pottery indicative of a specific use for cooking were found in the Khabur basin nor in the Sinjar. Only at Bouqras were some 'later' cooking pots found. In the Balikh and the Euphrates valley this phenomenon of disappearance also occurs, but a few hundred years later crushed-calcite-tempered pottery which is clearly cooking ware appears again, with better calibrated calcite (Le Mière 2009: 77). It could be proposed that a change in food preparation such as boiling was not the cause of the first use of pottery in the Jezirah and the northern Levant/Cilicia but rather its consequence, the experience of using pottery having led to it.

The characteristics of this pottery indicate an elaborated and skilful production and, together with the absence of failed attempts, suggest that it would not correspond to the first stages of the technique, which raises the question of its origin. The chemical analyses appear to point to a development of the pottery technique in another region and they could be of help in answering this question. Unfortunately none of the

geochemical characteristics of the imports are really typical of any specific geological environment which could indicate a particular region of provenance. However, many of the imports contain volcanic minerals, suggesting that the provenance is a volcanic area. The Taurus, a volcanic region, was the source of several materials such as obsidian, malachite, copper and chlorite, imported to the Jezirah before the appearance of pottery, even as early as the PPNA, and thus could be a plausible candidate for the origin of this pottery.

The very restricted area of the distribution of the early mineral ware could simply reflect the chances of investigation or discovery. Some early pottery has The Earliest Pottery of West Asia: Questions Concerning Causes and Consequences been found outside the area of the Jezirah and the northern Levant/Cilicia, such as at Tepe Guran or Çatal Höyük, but it is not the same type of pottery. Does such a distribution suggest a special relation or link between the sites of this restricted area? Or is it due to a common origin for the pottery of the whole area? It must be mentioned that the imports evidenced by the analyses do not all seem to have the same origin. The same source can, however, be proposed for some of the imports at sites very close to each other, namely Akarçay Tepe and Mezraa Teleilat as well as Tell Seker al-Aheimar and Tell Feyda, but there are clearly several origins for the various imports, although as mentioned above many of them could originate from the same large region. New investigations, particularly in eastern and central Anatolia, are necessary to find answers to these questions.

Concerning the technical context, which was favourable to the development of pottery technique (see above), the question of plant tempering should be examined. Although it had already been used for a few millennia in architectural material when pottery appeared, plant tempering was used for pottery fabrication in the Jezirah and the northern Levant/Cilicia only later in the development of the technique, which raises questions concerning the origin of mineral tempering as well as the question of the origin of pottery technology itself.

Concluding remarks

In the general context of the introduction of pottery, 'causes and consequences' are both matters for discussion. Food production, particularly agriculture, had been established long before pottery appeared. Thus pottery does not seem to be directly related to such changes, any more than it seems to be related to any other element of

Neolithisation. More evidence is required to understand the causes behind the development of the techniques of pottery fabrication. Concerning consequences, the late appearance of pottery in the Syrian desert and the southern Levant raises questions concerning the extent of the impact of pottery on the life of Neolithic people, since a pre-pottery site such as El Kowm II (Stordeur 2000) shows many parallels with contemporaneous pottery levels at Bouqras (Akkermans et al. 1983). The architecture, as well as other elements of material culture such as the lithic industry, which actually differs highly in the Late PPNB period from that of the Pottery Neolithic, could reflect the level of impact. In fact, various changes progress in this transitional period, but there could be a step in this development, not when the pottery appeared but when its presence intensified (Nishiaki and Le Mière, this volume), which would suggest that it was not the presence of pottery but the development of its use that produced consequences.

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Chapter 3

The Initial Pottery Neolithic at Tell Sabi Abyad, Northern Syria

Olivier P. Nieuwenhuyse

The Initial Pottery Neolithic at Tell Sabi Abyad

Tell Sabi Abyad is situated in the gently undulating plain of the river Balikh, a perennial tributary of the Euphrates, 30 km south of the Syro-Turkish border (Fig. 3.1). The site itself is part of a cluster of four prehistoric mounds, each between 1 and 5 ha in size, located in a roughly linear north-south orientation within a short distance of each other (Fig. 3.2). They were occupied from the late 8th until the early 6th millennium cal. BC, although not all of them contemporaneously. As far as we can estimate at present, habitation initially included all four sites, but after about 6800 cal. BC it contracted to the main mound of Tell Sabi Abyad I (Fig. 3.3, Fig. 3.4).

Over the past years, extensive excavations have been carried out at three of the four mounds (Tells Sabi Abyad I, II and III), each of which revealed layers with early pottery dated to the very beginning of the 7th millennium cal. BC (Akkermans 1993; Akkermans et al. 2006). At Tell Sabi Abyad I, the relevant layers were reached over an area of about 120 m² at the base of three deep soundings on the northwestern part of the site. This area has been termed Operation III (Fig. 3.3). At least three building phases in this area (levels A-12 to A-10) can be associated with the earliest ceramics. Each of these occupation levels featured free-standing, rectangular buildings consisting of many small rooms and surrounded by extensive open yards. The architecture was generally characterized by the use of very large mud slabs for building purposes, the application of white plaster on the floors and walls, and the construction of extensive mud-brick platforms which primarily served as

foundations. Significantly, the structures had been frequently rebuilt in the same place and on roughly the same alignment, suggesting a long, continuous use of space over several generations.

Similar features occurred at the neighbouring mound of Tell Sabi Abyad II, where the earliest pottery was found in very small quantities in the penultimate habitation level (level 2), with its limited occupation less than 0.5 ha in area (Verhoeven and Akkermans 2000).

The case of Tell Sabi Abyad II demonstrates how ongoing fieldwork may quickly change the archaeologist's perception. Initially, level 2 was attributed to the final stages of the Pre-Pottery Neolithic B period (Verhoeven and Akkermans 2000), but a few mineral-tempered sherds were in fact found during the excavations. At the time, this material could simply not be recognized for what it was. The finds were explained away as some form of intrusion from the Late Bronze Age – a few unequivocal LBA sherds had actually been found as well – and they were accordingly omitted from the report (Nieuwenhuyse 2000). A re-evaluation of our field notes now leads us to reject this earlier attribution, and to assign level 2 to the initial stages of the Pottery Neolithic. The final occupational stage at Tell Sabi Abyad II (level 1) contained coarse, plant-tempered pottery characteristic of the successive stage of the Early Pottery Neolithic (Van As et al. 2004).



Fig.3.1 Tell Sabi Abyad I from the north.

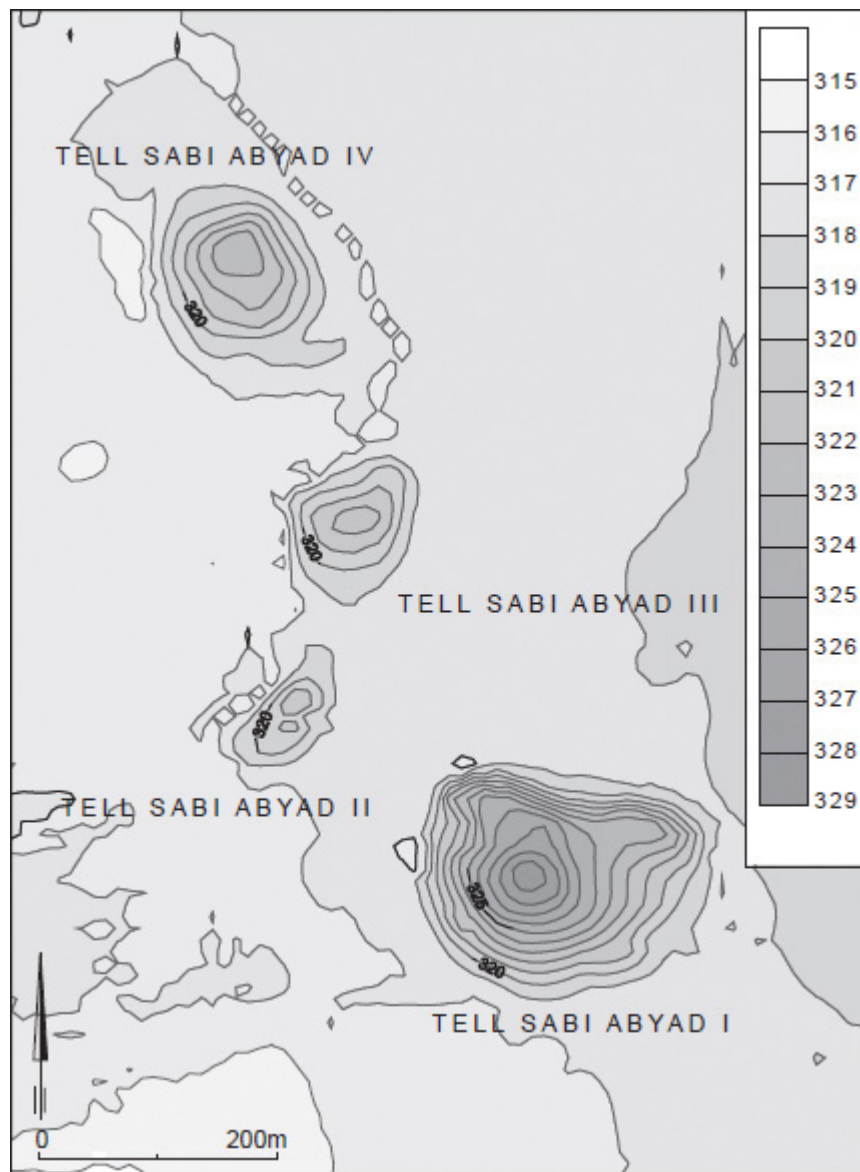


Fig.3.2 The cluster of four mounds of Tell Sabi Abyad I to IV. Excavations oncentrated upon Tell Sabi Abyad I. The Initial Pottery Neolithic was also concentrated on Tell Sabi Abyad I. The Initial Pottery Neolithic has also been attested at Tell Sabi.

Further, very early ceramics have also recently been excavated at one-hectare Tell Sabi Abyad III, in the upper occupational strata of trenches H7 to H9. These building levels, immediately below the surface of the site, exactly match the lowest layers found in the deep soundings at Tell Sabi Abyad I in terms of architectural remains and associated material culture. There can be no doubt that the sites existed side by side.

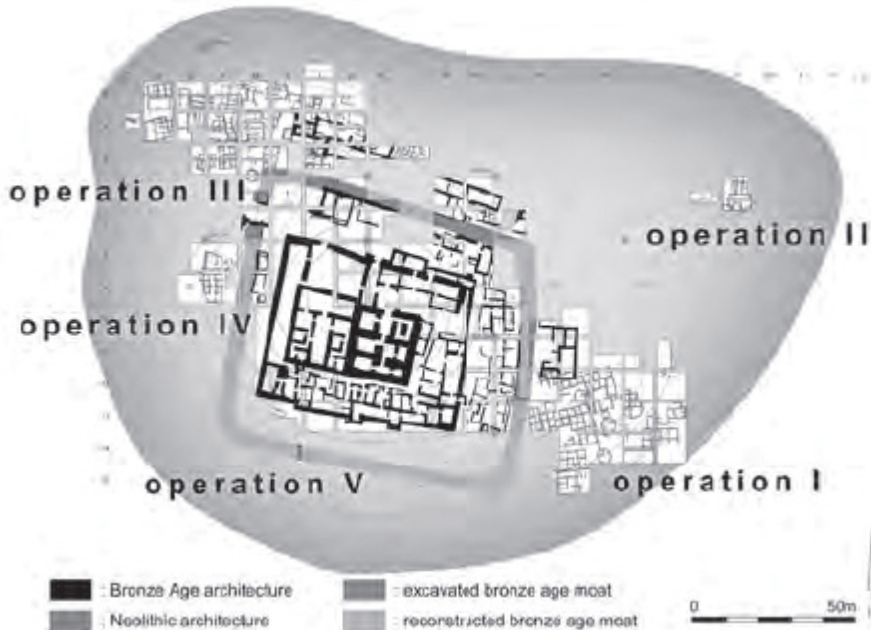


Fig.3.3 Tell Sabi Abyad I, showing the locations of the prehistoric trenches and of the Late Bronze Age settlement. The Initial Pottery Neolithic was excavated in trenches E3 to D4 in what is termed Operation III.

The ceramics from the earliest stages could hardly have been more different than those from the subsequent stages. We felt justified in introducing a separate phrase into the culture-historical framework for the Balikh Valley, the Initial Pottery Neolithic (Nieuwenhuys forthcoming). It is emphasized, however, that these terms refer to pottery. Specialists working on other material categories may arrive at very different periodizations and temporal boundaries. Such terminology, furthermore, should not obscure the considerable continuity, rather than change, at the transition from the Early (Pre-Pottery) Neolithic to the Late (Pottery) Neolithic. The earliest pottery layers at the three sites were immediately above deposits entirely devoid of ceramics. It is important to note that there was no stratigraphic or other hiatus between the lower, aceramic levels and the upper, ceramic levels. In fact, some of the buildings were kept in use throughout this transition.

Date cal. BC	Period	Tell Sabi Abyad I - operations					Tell Sabi Abyad II	Tell Sabi Abyad III
		I	II	III	IV	V		
5700	Middle Halaf			level D-1				
5800	Early Halaf	level 1						
		level 2		level D-2B				
5900		level 3	level 1					
	Transitional	level 4	level 2					
		level 5	level 3	level B-1		phase III		
6000		level 6	level 4	level B-2				
	Pre-Halaf	level 7		level B-3				
		level 8		level B-4				
6100		P-15 - B		level B-5				
		P-15 - q		level B-6		phase I		
		P-15 - y		level B-7				
6200				level B-8				
	Early Pottery Neolithic			level A-1				
6300				level A-2	level 1	phase I		
		P-10 - 11		level A-3	level 2			
6400				level A-4				
6500				level A-5				
				level A-6				
6600				level A-7				
				level A-8				
6700				level A-9			level 1	trench H-1
6800	Initial PNB			level A-10				
				level A-11			level 2	trench H-2
6900				level A-12				
7000	Late PPNB						level 3	trench I-1
7100							level 4	

Fig. 3.4 The stratigraphy, relative chronologies and absolute chronology of Tell Sabi Abyad.

A final point to be made is that it remains to be established to what degree the coarse ceramic assemblage from the following Early Pottery Neolithic levels at the site truly represents a break, notwithstanding the enormous differences. Alternatively there is also evidence to argue for rapid ceramic change and continuity. A small proportion of mineral-tempered pottery is present throughout EPN levels A-9 to A-2. Although different at first sight from the IPN mineral-tempered ceramics, it cannot be excluded at present that it evolved from these earlier wares.

A strong radiocarbon program provides a firm absolute date for the cultural sequence. Dates have been collected from Initial Pottery Neolithic strata at the various mounds of Tell Sabi Abyad. The dates from Tell Sabi Abyad I belong to the beginning of the period (levels A-12 and A-11; as yet no date is available for the upper level A-10), whereas those from Tell Sabi Abyad III belong to its end. Since the dates are statistically indistinguishable per level, they can be averaged to produce a date of roughly 7000–6800 cal. BC for building levels A12 to A11 at Tell Sabi Abyad I and a date of 6800–6700 cal. BC for the final strata at Tell Sabi Abyad III. Although the radiocarbon dates are very precise, the shape of the calibration curve for the time range

under discussion unfortunately spoils the precision, yielding ranges up to three centuries for the Initial Pottery Neolithic period as a whole, c.7000–6700 cal. BC (Nieuwenhuyse forthcoming; also Campbell, this volume).

The earliest ceramics at Tell Sabi Abyad

Extremely low densities of ceramic material most conspicuously characterize the earliest Pottery Neolithic levels. At this stage we can only give rough, qualitative estimates for relative ceramic densities, but there is little doubt that in this early phase ceramic vessels were very few in number. Small quantities of pots were available at this stage. Elsewhere in the Balikh valley a low density of early ceramic materials is attested at Tell Damishliyya (Akkermans 1988). At Tell Sabi Abyad ceramics did not develop into a mass-produced item until the subsequent stages of the Early Pottery Neolithic, from levels A-9 onwards.

The ceramics recovered from the initial Pottery Neolithic strata differ dramatically from the coarsely-made plant-tempered ceramics that characterize the younger levels. First and foremost, they were not plant-tempered at all, but made of a clay containing a high density of dark mineral inclusions (20–25% by volume, occasionally reaching 45%). At least some of these were basalt (technological studies are currently in progress). There is no doubt that these non-plastic inclusions were purposely added, as a temper. We provisionally use the term Early Mineral Ware (EMW) to refer to this category.

Furthermore, the conspicuous care with which the vessels were shaped and finished is distinctive. In stark contrast to the subsequent coarse pottery, EMW displays regular wall profiles and rims and an even wall thickness. Traces of the primary shaping were on the whole obliterated by intensive smoothing and burnishing, occasionally resulting in slightly glossy surfaces. Having said this, it may be relevant that none of the sherds thus far gave evidence for coiling, the shaping technique routinely employed for the later CMPT Ware. Instead, many of the smaller vessels may have been shaped by pinching. So far we have not found any examples showing traces of having been shaped on basketry or reed mats, as is occasionally seen during subsequent stages. Vessel shapes include simple convex-sided bowls and shapes with straight walls (Fig. 3.5). There are no vessels with abrupt angularities or with carinated profiles. ‘Ear-shaped’ lugs are present, however.

The surface and the cross-sections vary in colour. About one third of the vessels are lightcoloured throughout, indicating neutral to

oxidizing firing circumstances (surface colours ranging from 10YR 7/4, very pale brown, to 10YR 6/4, yellowish brown). The majority, however, are darker, shading into grey to dark-grey (5YR 3/1, very dark grey, to 10YR 5/1, grey). Surface colour often fluctuates from dark to light in the same sherd. To some degree this variation may indicate the use of different raw materials for pottery production, but it is also possible that firing circumstances played a role. The potters do not seem to have used specialized kilns, but they used open bonfires instead. In some instances the darker colour appears to have been caused by the use of the vessel over a fire. Traces of black soot are not infrequent (Nieuwenhuyse 2006).

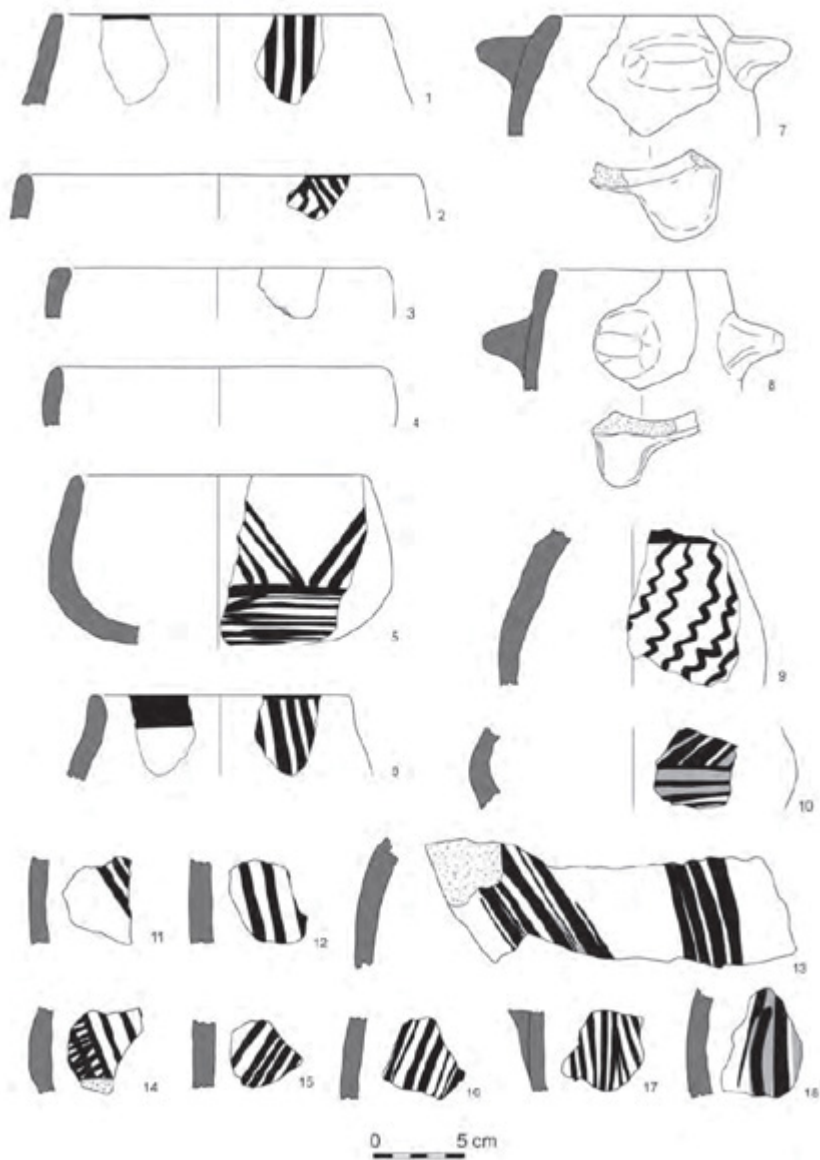


Fig.3.5 Tell Sabi Abyad: ceramics from the Initial Pottery Neolithic levels.



Fig.3.6 Tell Sabi Abyad: decorated ceramics from the Initial Pottery Neolithic levels.

Perhaps our greatest surprise was that this early pottery was occasionally decorated, although we have meanwhile learnt that this feature occurs with early pottery across Upper Mesopotamia (see the contributions of Le Mière and Cruells in this volume and Miyake 2009). The two decorative techniques are red slipping and painting (Fig. 3.6). A fugitive red-brown paint or slip is typical (2,5YR, dark brown, to 5YR 3/2, dark reddish-brown). The motifs rarely have sharply defined edges, so that it is sometimes difficult to see whether

some lines represent a roughly painted motif or an imperfectly executed slip. The design structures remained quite simple in any case. Design motifs include parallel diagonal lines, diagonal lines in alternating directions, crosshatching and diagonal waves.

At present we cannot say if this pottery was produced locally or if it was brought to the site from elsewhere. Obviously, the two possibilities are not mutually exclusive; a mixture of local production and exchange may have existed. On the face of it, the material from Tell Sabi Abyad looks suspiciously similar to some of the pottery reported from Akarcay, Salat Cami Yanı, and Seker al-Aheimar (see the contributions of Cruells and LeMière in this volume and Miyake 2009). Certainly, there was significant regional variation, too, for instance in the type of lugs (LeMière, this volume), as well as, it appears, in raw materials. Nonetheless, it seems possible to suggest that, by and large, the earliest ceramics from Tell Sabi Abyad belonged to the same ceramic tradition attested at these other sites. Indeed, there is the distinct possibility that some of the early ceramic vessels functioned in networks of exchange, and travelled from one site to another. Further technological and comparative studies will have to shed light on this issue.

A regional perspective?

In the Balikh Valley, in addition to the finds at the cluster of mounds at Tell Sabi Abyad, early ceramics have been identified at Tell Damishliyya I by Marie LeMière (LeMière, this volume). Were those four villages the only ones to adopt early ceramics? The strong similarities observed between the earliest ceramics from sites distributed far apart across the Upper Mesopotamian plains suggest otherwise. It is likely that there were other villages in the immediate region that took this step. However, we are facing difficulties in identifying those sites in the archaeological record. The characteristics of the earliest pottery itself form an almost insurmountable obstacle: available in minute quantities, made of low-fired, fragile materials, and easily mistaken for something completely different, as the example of Tell Sabi Abyad II shows. In the absence of excavations, field reconnaissance may be of limited value. The absence of early ceramic materials in survey collections may testify equally well to chronology, to biased representation, or simply to the rejection of early pottery by the local community involved. So far our understanding of early 7th millennium cal. BC lithic typologies have not evolved to a level of sufficient chronological sensitivity to allow the identification of the Initial Pottery Neolithic on an independent

basis. Identifying the regional context of the earliest pottery use presents a genuine methodological and conceptual challenge.

So what may have been the regional setting for the adoption of ceramics during the Initial Pottery Neolithic stage? As a first step towards further exploration we might compare the regional evidence for the final stages of the PPNB and the Early Pottery Neolithic. Peter Akkermans (1993: 138–203) has reconstructed PPNB and Late Neolithic settlement patterns in detail; further insights into the Early Pottery Neolithic can be gained from a close re-examination of the ceramic evidence collected during the University of Amsterdam survey in the Balikh in the 1980s (Fig. 3.7). Obviously, these two periods were both of long duration, making the contemporaneity problem (Akkermans 1993: 168; Pollock 1999: 63; Schacht 1984) a very relevant issue. The resulting map presents a palimpsest of village histories, quite likely masking much short-term movement and site relocations.

If we take the evidence at face value, site numbers may suggest an abrupt, short-lived ‘abandonment’ following the Pre-Pottery Neolithic, The Initial Pottery Neolithic at Tell Sabi Abyad, Northern Syria followed by a gradual, but partial, return during the Early Pottery Neolithic (Table 3.1). Discovery bias, however, almost certainly plays a role in explaining the scarcity of Initial Pottery Neolithic sites. Significantly, all of them are excavated sites. The chances of identifying this stage or proving its absence in the southern Balikh without excavation would seem to be virtually nil. If we take one step back, most of the sites that have yielded coarse Early Pottery Neolithic ceramics have also yielded evidence for occupation during the Pre-Pottery Neolithic (Akkermans 1993: 170). At least some of these may represent candidates for the Initial Pottery Neolithic.

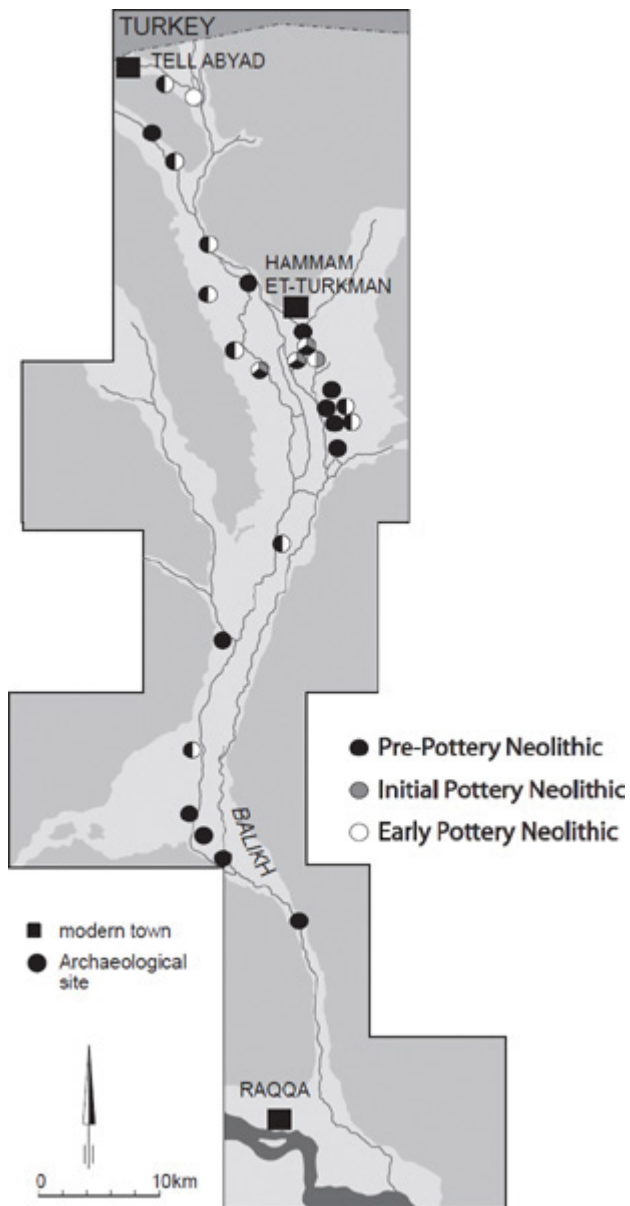


Fig.3.7 The distribution of known Pre-Pottery Neolithic, Initial Pottery Neolithic and Early Pottery Neolithic sites in the Balikh Valley.

	Pre-Pottery Neolithic (Balikh I)	Initial Pottery Neolithic	Early Pottery Neolithic (Balikh II-A)
	N= 24	N= 4	N= 14
BS 34			
BS 36			
BS 56			
BS 81		?	
BS 95			
BS 114			
BS 148 T. Mounbatah		?	
BS 161		?	
BS 162		?	
BS 163			
BS 164			
BS 165			
BS 177 T. Damishliyya I			
BS 178		?	
BS 189 T. Sabi Abyad I			
BS 190 T. Sabi Abyad II			
BS 191 T. Sabi Abyad III			
BS 192			
BS 212			
BS 235		?	
BS 245 T. Assouad		?	
BS 276			
BS 282			
BS 295		?	
BS 316			
BS 341		?	

Table 3.1 Balikh Valley sites with evidence of Pre-Pottery Neolithic, Initial Pottery Neolithic and Early Pottery.

Interestingly, sites with early ceramics tend to be restricted to the northern parts of the surveyed area (Fig. 3.7). The most straightforward interpretation would of course be that the earliest stages of the Pottery Neolithic saw an abandonment of the southern parts of the valley (Akkermans 1993: 170–172). Alternatively, however, the resulting figures may also point to a partial, regionally differentiated adoption of pottery by final Pre-Pottery Neolithic communities. It is equally possible that initially ceramics were accepted only by groups occupying the northern parts of the valley, after which the use of pottery gradually spread southwards. Significantly, much further to the south, the inhabitants of Tell Bouqras on the Syrian Euphrates or el-Kowm in the Syrian desert would continue their aceramic ways of life for several centuries.

Some concluding remarks

The excavations at Tell Sabi Abyad document a local transition from the later stages of the PPNB into the Pottery Neolithic. Apart from the addition The Initial Pottery Neolithic at Tell Sabi Abyad, Northern Syria of pottery, the exposures at the site suggest a strong cultural

continuity. Some of the buildings remained the same, both in design and in location, suggesting social continuity as well. The adoption of pottery, it would seem, initially had little impact on early 7th millennium cal. BC ways of life.

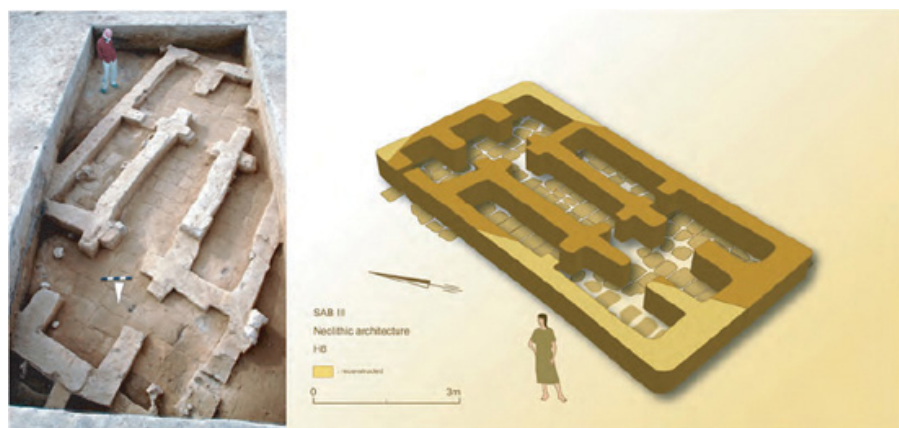


Fig. 3.8 Tell Sabi Abyad: the cultural context of the earliest pottery. Pisé buildings on platforms, continuously in use throughout the transition from aceramic to Pottery Neolithic (example from Tell Sabi Abyad III).

Intriguingly, the evidence so far suggests no ‘trial’ stage in which novice potters can be seen to be ‘experimenting’ with their new technology. At Tell Sabi Abyad, the Initial Pottery Neolithic levels fit within a continuous, well-dated stratigraphic sequence; there is precious little chronological space to allow for undiscovered intermediate levels. The earliest ceramic products seem to have arrived in a fully developed state. One very plausible explanation could be that the earliest vessels were not made locally, but came from some other, as yet unknown, region where the necessary experimenting had taken place previously (see Le Mièrè, this volume). If so, this might be the area immediately to the north, where contemporaneous sites are being excavated.

Alternatively, considering the emerging evidence for significant regional variation in early mineral-tempered pottery technology, and taking into account what appears to be a rapid adoption of early pottery across a considerable part of Upper Mesopotamia, it seems possible to suggest that the necessary steps were taken more or less simultaneously over a large geographic space. Significantly, apart from ceramics, a wide range of materials and technologies existed, side by side, for making durable containers. Well-attested categories at the site include unfired clay, stone, white ware and bitumen-coated basketry. These alternatives to ceramics may have been relevant for

the transfer of technological knowledge, which eventually coalesced into pottery production, but they also give some indication of the social receptivity at the time (Bernbeck, this volume). Such alternatives to pottery existed already in the PPNB, as evidenced at Tell Sabi Abyad II, but they seem to have grown in importance in the 7th millennium cal. BC, alongside the introduction and subsequent development of fired clay containers.

We are hard-pressed to state with certainty what activities were associated with the earliest vessels at Tell Sabi Abyad. It seems unlikely that the earliest pottery was used for storage. If it was, this can only have been on a small scale and over the short term. Certainly, large, tall-necked storage jars would eventually become part of the ceramic repertoire, but this appears to have been a drawn-out process, associated with the development of plant-tempered ceramics in the later Early Pottery Neolithic levels.

Cooking may certainly have been one of the uses of the early mineral-tempered ceramics. The occasional lugs would have improved the performance potential of the vessels during such activities. Traces of soot indeed suggest that at least some of the early vessels from Tell Sabi Abyad were used over a fire.

Whatever activities are associated with this early pottery, it may be relevant that they are recovered from, specifically, household contexts (Fig. 3.8). These precious containers may have materially expressed collectively-held practices that involved the conspicuous consumption of food and drink at the level of the individual household. We may perhaps think of ritual occasions or the reception of guests. Associated with specific social roles, occasions or memories, early pottery containers may have been part of the tool set that enabled Neolithic communities to establish networks beyond the local village.

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Chapter 4

Akarçay Tepe and Tell Halula in the Context of the Earliest Production of Ceramics in West Asia

Walter Cruells, Josep M. Faura and Miquel Molist

Introduction

Since the beginning of the 1990s, in the northern Levant and Euphrates valley in particular, the horizon related to the earliest appearance of pottery production has been poorly documented. In the Euphrates valley area no site had yet been excavated and knowledge of the few documented settlements was deficient – known only from surveys or irregular excavations. This image led to interpretations that postulated a loss of influence of this region compared to former periods or even a displacement of population to neighbouring regions such as the coastal region or the Jezirah, suggesting a break in settlement models between the pre-ceramic horizon and the ceramic Neolithic, coincident and comparable with the ‘hiatus’ observed in the southern Levant (Hours and Copeland 1983; Cauvin 1978; Cauvin 1985; Moore 1985).

Nevertheless, the last two decades of archaeological research have allowed us to recognize continuity in human settlement and the new data permits preliminary knowledge of the characteristics of these groups. Concerning the Euphrates valley and related to the beginning of the 7th millennium cal. BC, we have information from several sites. On the one hand, some previously known sites like Abu Hureyra (Phase 2C) (Moore et al. 1975; Moore 1992) and the upper levels of Bouqras (Akkermans et al. 1983) show continuity without a break from the previous phase, although they present an occupation centred on the first part of the 7th millennium cal. BC immediately before the abandonment of these sites.

On the other hand, the archaeological work centred on rescue campaigns in the Tishrin Dam area have shown important novelties, such as a re-occupation at the site of Dja'de el Mughara with several levels (Coqueugniot 2000 and pers. comm.); a new occupation, without evidence of habitation, at the Ubaid site of Kosak Shamali (Matsutani and Nishisaki 1994, 2000); and a long occupation at the

site of Tell Halula, where a stratigraphical sequence that covers this horizon has been established (Molist 2001; Molist et al. 2004, 2007). To these sites we have to add other sites discovered through superficial surveys like Hamman Seguir, Hamman Kebir, and perhaps Molla Assad (Copeland and Moore 1985). In the northern zone, already known in the Turkish Euphrates valley, the first discoveries of Gritille (Voigt 1985 and 1988) and Kumartepe (Roodenberg 1989) as well as the revision of the site of Yumukepe (Caneva 1999; Balosi this volume) have been complemented with new and important finds in the zone affected by the new Karkemish dam, with Akarçay Tepe (Arimura et al. 2000; Arimura et al. 2001) and Mezraa Teleilat Hoyuk (Özdoğan 2003) being the most representative.

Nevertheless even this rich panorama of settlements does not present, from our point of view, enough systematized information to permit an agreed regional synthesis. Because of this, in this paper, we will centre our exposition on the sequence and information obtained at the sites of Tell Halula and Akarçay Tepe as the axis for our analysis.



Fig.4.1 Situation of Tell Halula and Akarçay Tepe in the Euphrates valley.

From a technological point of view, the pre-pottery Neolithic stage in West Asia already shows a high degree of development. In that sense, research on the Tell Halula PPNB layers has produced much information on the procurement and subsequent use of limestone and chalk in plaster. At Tell Halula, combustion pits have been found for

producing lime plaster, which was used to build floors and walls. Houses floors normally have a 3–4 cm thick plaster finishing surface and, in some examples, different parts of the floors and walls were painted with different decorative patterns, mainly human figurative and geometric. Red and black were the main colours used to paint these extraordinary and colourful panels, and the pigments used were iron oxides (magnetite and hematite). The technology of fire was also well known during the 8th millennium cal. BC, represented by a great diversity of domestic fire structures. However, the irreversible chemical change which takes place when a clay artefact is heated to a sufficient temperature was probably known during the PPNB period, specifically for clay objects such as figurines. So most probably, the appearance of ceramic technology predates full Neolithic sedentism and farming.

As a result of the new research at the two sites, the general picture of the first pottery production in West Asia has also changed significantly. Traditionally, the first pottery was presented as very low quality vessels with the fabric sometimes labelled as ‘friable’, with large amounts of plant temper and poorly fired. Today, repeatedly, a few potsherds appear in sites with continuity in occupation from Akarçay Tepe and Tell Halula in the Context of the Earliest Production of Ceramics in West Asia the latest PPNB stages. These show a high technological level which radically differs from previous definitions of initial pottery production. Probably, some potsherds, which were in fact found in older prehistoric excavations in sites with a long PPN sequence, were originally considered to be intrusions.

Most probably many late PPNB sites had a temporal continuity until slowly and gradually the first pottery vessels made their appearance. Evidence at Tell Halula, as well as at Akarçay Tepe, shows that a very limited number of potsherds start to appear in final PPNB layers. Sometimes a building erected in the final phase of the PPNB was reconstructed with new floors but using the same main walls and produced, from both interior and exterior deposits, the very first potsherds. Most likely the emergence of ceramic technology appeared independently in different areas although not all neolithic communities embrace this technology at the same time.

The context of the earliest pottery at Tell Halula and Akarçay Tepe

At the site of Tell Halula, as already noted, occupation of the 7th millennium cal. BC has a full stratigraphic continuity from the pre-ceramic layers up to the first pottery production. Both stratigraphic and chronological evidence indicates continuity of human occupation

throughout the first half of the 7th millennium cal. BC when the first ceramic production appear. In this way, the study for the present symposium encompasses the totality of the information linked to the first pottery production; strictly speaking, that is the levels that have been dated to the first quarter of 7th millennium cal. BC.

Layers related to the first pottery production have been discovered in different parts of the site: in the southern area (sector 2/4) as well as in the eastern area (sector 07). Stratigraphically, the first assemblage comes from sector 07 where, above several late PPNB layers (SS7I to SS7III), four layers (SS7IV to SS7IX) appeared with a set of material remains (pottery and lithic) which are indicators of the first pottery production phase.

The second area where such an assemblage has been located comes from sector 2/4. The excavation produced several successive levels (S2/4 XX; S2/4 XXI and S2/4 XXII), stratigraphically located above the pre-ceramic deposits, in which the material recorded included the first pottery. Finally, during the most recent season, in this same part of the tell, the first pottery production layers have been excavated in squares 2G, 2I and 2H; the remains retrieved are in course of analysis and definitive publication.



Fig.4.2 Tell Halula. Sector 2, square 2E/F, level B1a. Part of a rectangular plan house (Early Pottery Neolithic).



Fig.4.3 Tell Halula. Sector S7 in eastern area (Early Pottery Neolithic). Fragment of a wall.

The architectural evidence and its spatial relationship to the occupation pattern indicate a substantial variation in relation to the previous stages of the settlement. Concerning layers with the first ceramic production in the strict sense, we would distinguish between elements from sector 2/4, in the southern part of the tell, which had constructions of a domestic type, and the elements located in the eastern part, sector SS7, where collective or communal facilities were found. Specifically in sector S2/4, layers XX to XXII, and in square 2E and 2F, the remains of domestic buildings with large surrounding areas have been located which permit a characterization of the space (Fig. 4.2). In effect, the different domestic units are distributed in a random way, separated by large external areas where some structures (hearths, ovens, pits etc) are placed and a great accumulation of domestic debris (with evidence of combustion, faunal remains etc). The oldest domestic structures continue with the tradition of a rectangular plan but with significant variations. Building plans continue to be pluri-cellular, but with a much more irregular distribution. Technical variations also occur; for example, a greater use of stone as a building material and a decrease in the use of the plaster. The most common technique of treatment of the floors is beaten earth and only a few examples are plastered.

The dispersed nature of the domestic constructions, with little investment in labour, contrasts with the care given to the collective ones. Excavation from sector SS7 show two constructions that can be

considered of this type. The first is a large wall built with stones, almost 1.20 m wide and with a preserved height of 1.10 m which delimits the site in its eastern part (Fig. 4.3). The second is a system of water drainage, formed by a small excavated trench with a careful treatment of the walls and bottom which are covered by prepared slabs. The best preserved part, has been documented to a length of 16 m (Fig. 4.4).

At the site of Akarçay Tepe, the evidence for layers with the first pottery production is well defined and related human occupation has been excavated in two areas of the site; during the first season in the western part of the site or 'West Tepe' and in later seasons in the eastern areas or 'East Tepe'.

In the western area, trench 20T, the excavation enabled the discovery of the first pottery production within a diachronic frame and the observation of its evolution from pre-ceramic layers (layers 12–23) up to the sequence of the latest Pre-Halaf (layers 2–6). The first pottery production at this part of the site was documented in layers 7–11 and was later also found in other trenches (20O and 21O). Also interesting are the pit ovens found at Akarçay Tepe, both in the eastern part (trench 29T) and in the western part (trench 21O), where deep and elongated pit-ovens were found in open areas. The structures had mud plastered walls and floors with evidence of fire (Fig. 4.5). These kinds of structures, already found at other sites (Secker al-Aheimar and Salat Camii Yanı, in this volume), could be used to heat stones, and usually they are filled with the remains of ashes and small stones and could be associated with culinary activities.



Fig.4.4 Tell Halula. Sector S7 in eastern area (Early Pottery Neolithic). Fragment of the water channel.



Fig.4.5 Akarçay Tepe. Pit-oven in the square 210 external working area.



Fig.4.6 Akarçay Tepe. Buildings BA and BB in the east sector (Early Pottery Neolithic).

More interesting are the discoveries from the high part of the eastern tell. The extensive excavation has permitted the documentation of the full continuity of the levels from the preceding pre-ceramic sequence (layers 6–12). Thus, layers 2 to 5 in squares 29U, 29V and 29T have revealed remains of the village. The character of the inhabited space is similar to that observed at Tell Halula; that is large isolated units of habitation surrounded by large open spaces where domestic structures (pit holes, hearths, ash pits etc) were placed, as well as a high concentration of domestic debris.

The buildings (BB and BA) are mainly of rectangular plan, basically unicellular of cell plan type with foundations normally of stones (limestone and basalt) and internal floors in *kerpiç* or beaten earth. The short height of the preserved walls makes it difficult to define the entrances (Fig. 4.6).

From an economic point of view, at both sites the full development of agricultural and livestock management is attested. The management of vegetal resources already indicates a full development of agricultural activity (Buxó and Rovira in press) and, in relation to animals, a certain degree of diversification in production from domestic herds is documented. The production of milk, wool and the possible utilization of bovines for labour contributes to the implementation of new farming strategies not only centred on the

combination of species but also on their secondary products. The progressive decrease of ovicaprines and bovines in meat production, the relative increase of the suids and, occasionally for some species, the presence of hunting, show the full range of farming techniques during the pre-Halaf occupation at Tell Halula (Saña 1999; Saña et al 2001).

Chipped and polished stone industries indicate significant variation with respect to previous periods. These variations affect the supply of raw materials as well as their management and the final products. Although techniques of laminar production continue, other more diversified techniques have a more active role. The final product is now characterised by a more banal aspect, and is especially constituted by arrowheads, retouched blades, retouched flakes, burins, scrapers etc. that have lost, in general terms, the characteristic investment of labour and the beauty of the earlier phases (Borell 2006, Ferrer 2000; Molist et al 2001; Molist 1998).

However, this lack of elaboration of the lithic industry does not affect its use. The range of activities carried out remains high and with a level of performance identical to the previous phase. We have to look at this technological change not so much as a variation in functionality but rather as a global social and economic change in production processes.

Up to now ^{14}C dates for this first stage of pottery production remain scarce and only five dates are available. Two of them belong to the site of Akarçay Tepe and the other three to Tell Halula. All five samples have been analyzed on charred material (charcoal) and are described in [Fig. 4.7](#) where we can see their references, BP date and corresponding calibrations. It is true that three of them have a very large intervals (between 120 and 530 years) but they fit quite well in the first quarter of the 7th millennium cal. BC and are in accordance with the overall stratigraphic sequence obtained at each site. This particular period is of crucial importance as it is when the first pottery production actually appeared in most parts of West Asia.

The early pottery of Akarçay Tepe

The appearance of ceramic production at Akarçay Tepe is mainly characterised by the restricted number of vessels found. The earliest assemblage is basically mineral tempered, showing a high degree of consistency. When analysing fabrics macroscopically, however, we can separate them into different groups based on the composition and nature of the clay, although all of them appear contemporaneously.

Fabrics are made from carefully selected clays to which different

kinds of minerals were added prior to the manufacture of the vessels. Pottery vessels with mineral inclusions represent 88.97% of the total and, when plant inclusions appear, they start at 11.03% and increase rapidly in the following later layers.

Several kinds of minerals have been observed macroscopically. First of all, and dominant, are fabrics with calcite grits (38.13% of the total), calcite grits with sand, sand with particles of mica, small basalt grains (8.63%) and a few examples where carbonates are common and, in the final stage, mineral inclusions mixed with plant material (Figs 4.8–4.10). The sizes of these mineral grains are normally large, over 1 mm, so inclusions like calcite must have been crushed prior to their inclusion in the fabric.

Fabrics are hand-made in all cases, normally very compacted and heavy, and probably constructed by rolled coils and pinching, which we have observed in several cases. Vessels walls have an average thickness of around 6–9 mm although the range goes from 5 to 15 mm. Vessels have a standard finish based on a good polished surface on the exterior and on the upper part of the interior (82% of the total); 12% show smoothed surfaces and 2% are DFB wares, sometimes in combination with polishing and a slipped band under the lip. 4% of the sherds have damaged surfaces.

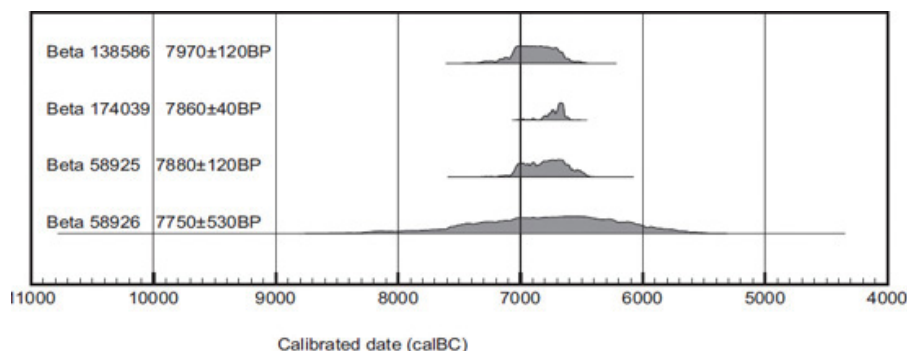


Fig.4.7 Calibrated ^{14}C dates for Akarçay Tepe (Beta-138586 and Beta-174039) and Tell Halula Beta-58925 and Beta-58926) earliest pottery production, obtained from charred material samples.

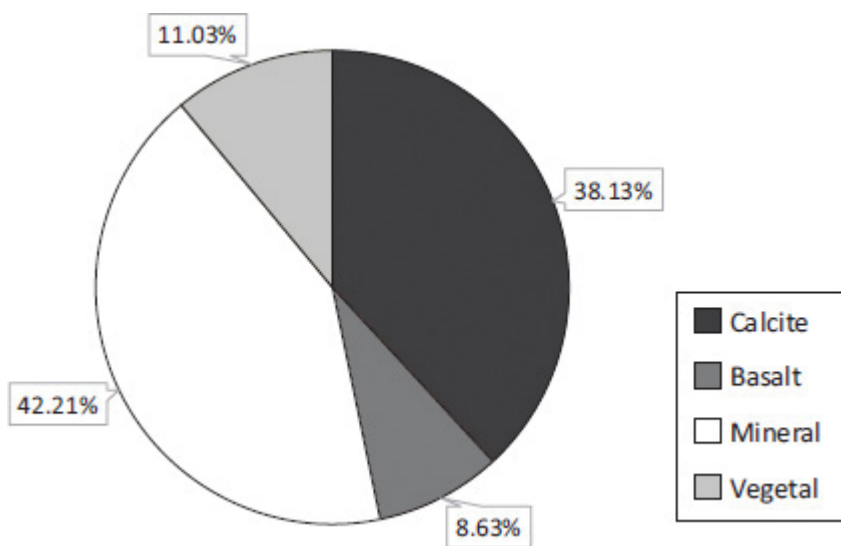


Fig.4.8 Proportions of inclusions in the Akarçay Tepe ceramic assemblage.

The firing of these pottery is, technologically, very high but there is also a diversity in the firing techniques of a small number of vessels. Most popular are completely reducing atmospheres (68.59% of the total), which show completely black cores, but also present are oxidised fabrics with red/orange cores (13.19%), incompletely oxidised fabrics (7.19%) with orange and dark orange cores, bitone cores with dark colours in the internal part and orange in the external sections as well as sand-wich cores with a black colour in the middle and orange in the external parts (11.03%) (Fig. 4.10).

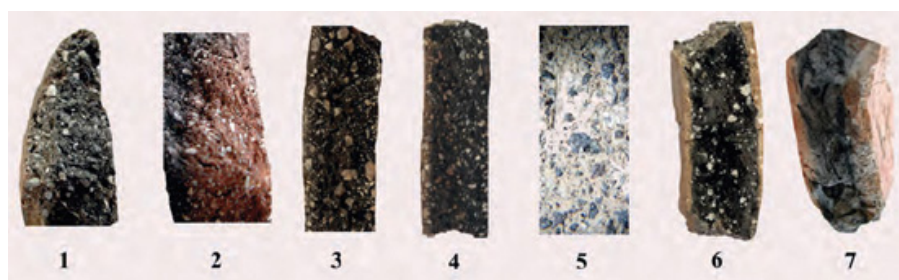


Fig.4.9 Nature of the inclusions (Akarçay Tepe). 1 and 2, calcite grains; 3 and 4, calcite and sand; 5 basalt grains; 6 calcite and plant; 7, plant and mineral.

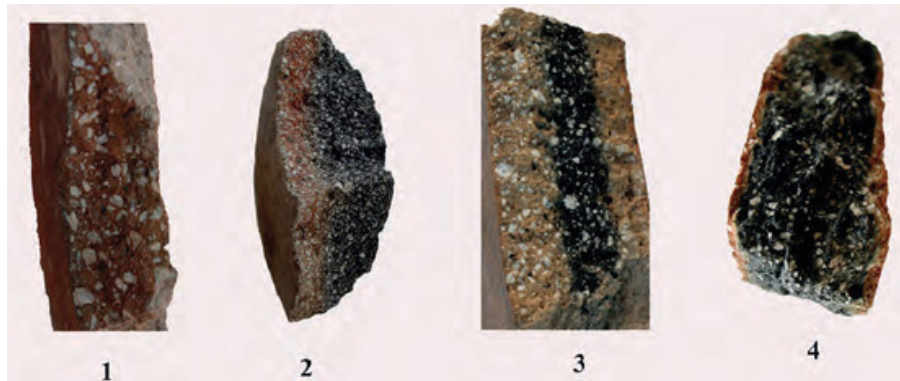


Fig.4.10 Typical firing conditions (Akarçay Tepe). 1, oxidising; 2 and 3, oxidising/reducing; 4 reducing atmosphere.

The functionality of these first vessels remains unclear. Although their technological traits would have allowed them to be used as cooking pots, resistant to thermal shock, very few sherds show evidence of this. The very small number of vessels found, sometimes only two or three vessels in a layer, suggests that rather than having a functional utility the vessels were prestigious products.

The ceramic assemblage from the earliest stages at Akarçay Tepe is composed of 417 sherds which come from eight trenches in the eastern and western areas of the site. Of these 88.97% (n = 345) are mineral tempered sherds and 11.03% (n = 72) plant tempered (Fig. 4.11).

Undiagnostic sherds amount to a total of 278 (66.66% of the total) and diagnostic sherds are formed by rims (n = 90 and 21.58%), bases (n = 27 and 6.48%) and handles (n = 22 and 5.28%) (Fig. 4.12).

Fig. 4.13 illustrates the composition of the ceramic assemblage from the earliest Neolithic Pottery stages at Akarçay Tepe, trench T20, once they are separated by their basic fabric traits and specifically by inclusions. These first pottery sherds appear from layers 11 and 10 (trench 200) and rapidly increase in number in layers 9–7 (in trenches 200, 210 and 20N) with a sequence which also shows a gradual evolution in their main technological and morphological traits.

The graphs shows that sherds coming from layers 7 to 11 have mainly mineral inclusions. On the other hand, from layer 6 onwards, the tendency is the complete opposite and plant tempered sherds increase in number. In an analysis of the diachronic sequence, we can see a gradual evolution in ceramic technological and morphological traits which show an inflection point at layer 7 when vessels with plant inclusions appear, although in small numbers. From that layer onwards, the trends reverse and vessels with mineral inclusions

became less significant. In fact, we still do not have sufficient information to be clear of the full implications of this technological evidence and await future excavations to enlarge our understanding of these layers.

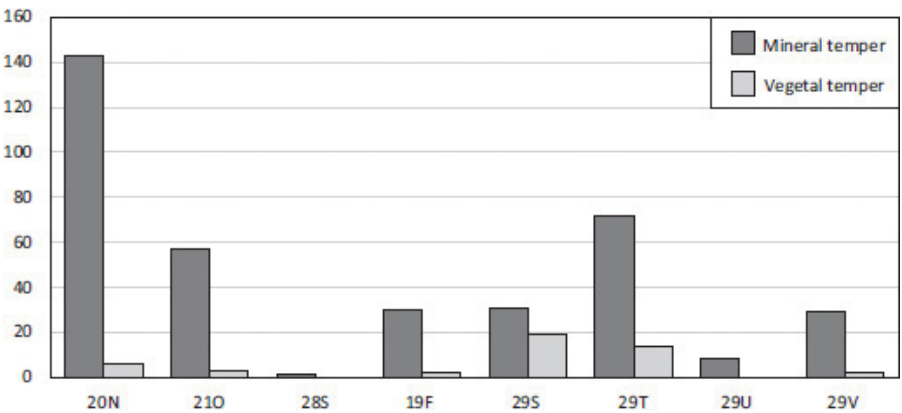


Fig.4.11 Total number of pottery sherds by trench from the earliest production stage at Akarçay Tepe.

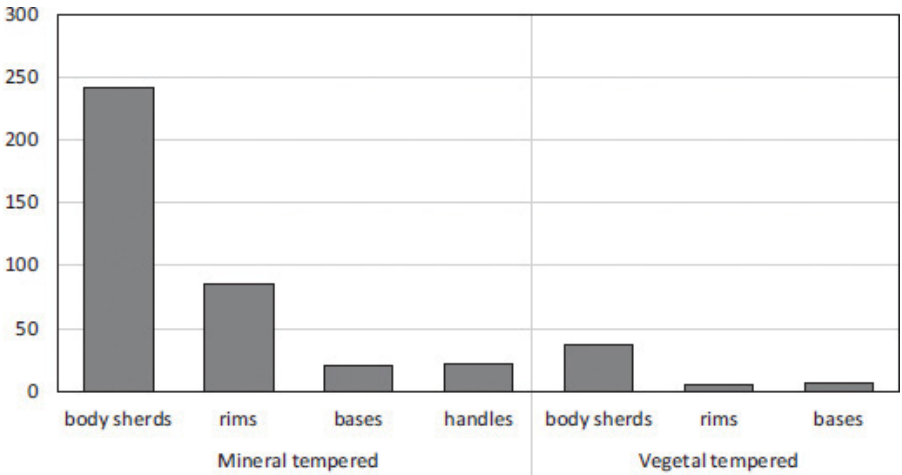


Fig.4.12 Diagnostic nature of the sherds at Akarçay Tepe by type of inclusion.

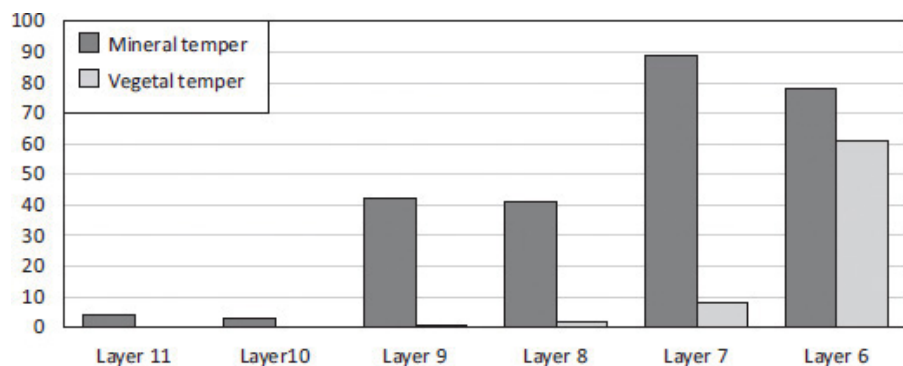


Fig.4.13 Evolution of the earliest pottery in trench T20 at Akarçay Tepe according to their inclusions.

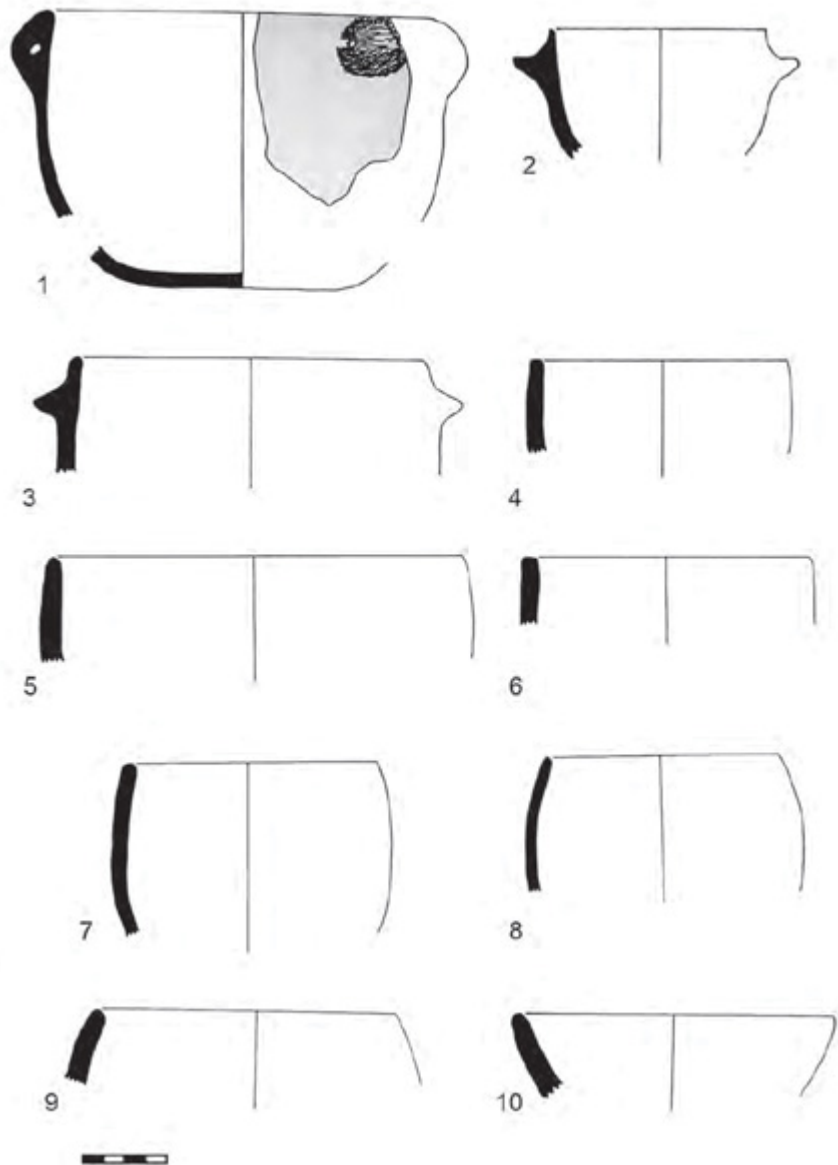


Fig.4.14 The Earliest ceramic shapes at Akarçay Tepe.

Taking into account the lower number of sherds from these layers (7 to 11), the number of complete or reconstructable vessels is very limited. The main types are deep bowls with straight walls, sometimes slightly closed, with flat rim and a flat or slightly round bases. Some vessels have a pair of simple, plain, diametrically opposed lugs which develop, over time into large, pierced lugs starting at the rim and descending down around 8–10 cm.

The most representative shape is a vertical, convex-sided bowl (Fig.

4.14: 1–7), one example of which has a flat base. Rims are mostly round but flat rims are also present (Fig. 4.14: 4). Large numbers of this vessel shape have a pair of horizontal ledge handles under the rim. One example is horizontally pierced.

A few examples of convex-sided bowls are also present at Akarçay Tepe (Fig. 4.14: 8–9). A final shape recovered is an everted, convex-sided bowl with no information concerning the base (Fig. 4.14: 10).

The earliest pottery from Tell Halula

Using typological and morphological studies, chemical and petrographical analyses and the comparative study with other materials and structures related to the corresponding occupation phases, we hypothesise three different and consecutive ceramic phases belonging to the pre-Halaf horizon (Faura 1996a; Faura 1996b; Faura and LeMière 1999).

Phase 1 relates to the emergence of pottery in West Asia. Phase 2 is a period of consolidation and widespread use of ceramics. These two phases constitute an evolutionary sequence that covers the first half of the 7th millennium cal. BC, while phase 3 belongs to a more recent horizon and is an evolution of the earlier tradition. The most characteristic elements are the red slip wares, the incised/impressed decorations, decoration on light surfaces and the necked jars. Phase 3 is chronologically placed in the second half of the 7th millennium cal. BC.

Ceramic phase 1

The earliest ceramic assemblage from Tell Halula has been found in Sector 7, (levels IV–IX) and in Sector 2 (trenches E/F), where the combined materials of the site makes a total of 826 sherds. Considering the high frequency of other archaeological remains and the size of the related structures, the total number of sherds is very low.

The manufacturing techniques are not simple but developed. Macroscopic study and diverse microscopic analyses indicate knowledge of the advantages of selecting clays, the selective use of temper and the control of firing temperature.

A petrographic study of samples from ceramic phase 1 of Tell Halula has already been made (the results of analysis of thin sections from Tell Halula can be found in Faura 1996a). Some of the results obtained on the 24 thin sections analysed allows the suggestion of different groups:

- a) Fabrics with exclusively carbonate present; taking into account the high degree of compositional coherence with the immediate geological surroundings of the tell, it is possible to suggest they are locally produced.
- b) Ceramics which contain elements of volcanic origin. They might be locally produced, taking into account that ceramics could be made from clays from deposits formed by the Euphrates river about 2 km away from the site, or they might be produced using clays that can be found in a distant location, where, in addition to the limestone substrate, the presence of volcanic phenomena is known, for example, in the area of Qara Qozak, and imported to Tell Halula.

The petrographic study also allows us to suggest diverse aspects concerning some technological characteristics of these ceramics:

- a) Either vegetal or crushed calcite elements were added by the potter during the process of manufacturing the pots.
- b) Concerning firing temperature, the study permits us to propose that pots would have been fired at a relatively low temperature, between 700–800 °C.

The main criteria for the basic classification has been the nature of inclusions. The macroscopic study of the inclusions has allowed us to distinguish two main groups: mineral and vegetal. Sherds with mineral inclusions are the most common in this phase, making up 72% of the total, while sherds with vegetal inclusions make up 28%. The presence of vegetal inclusions increases significantly in the later levels, reversing the tendency of phase 1.

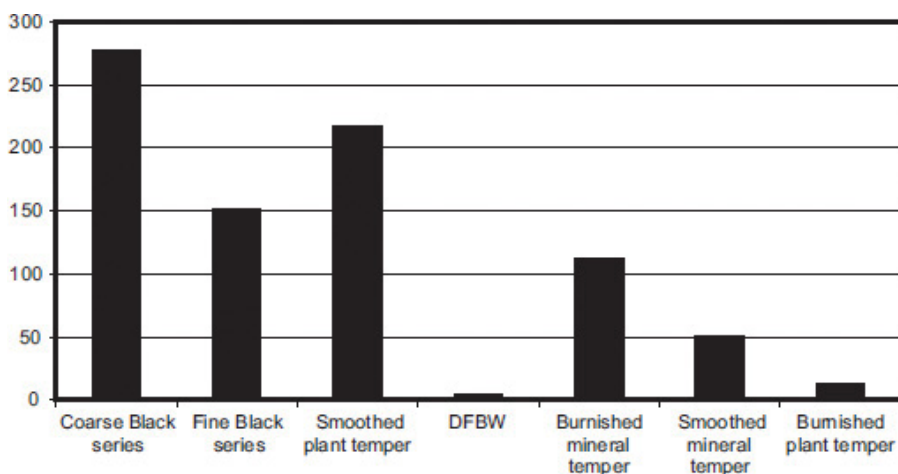


Fig.4.15 Major ceramic groups at Tell Halula.

Manufacturing characteristics, surface treatment, texture of the fabrics, size and quantity of temper and firing conditions have been the criteria used to establish seven different main groups: ceramics with vegetal temper and smoothed surfaces; ceramics with vegetal temper and polished surfaces; ceramics with mineral temper and smoothed surfaces; ceramics with mineral temper and polished surfaces; ceramics with fine calcite (Fine Black Series); ceramics with medium or coarse calcite grains added; and Dark Faced Burnished Ware (Fig. 4.15).

Most of the sherds with vegetal inclusions are very fragmented so it is difficult to describe their morphology. Nevertheless the main shapes recovered are: small, closed jars with a spherical shape; simple, closed or open medium-sized jars sometimes with handles and bases which can be plain without an inflection point, plain with an inflection point or over-raised with an inflection point (Fig. 4.16).

The wall thickness of the majority of sherds varies between 11 and 15 mm. Surfaces have light colours, mainly beige, light brown or orange, with black or grey cores due to incomplete reoxidizing. Smoothed sherds with completely oxidizing firing represents 21.5%, completely reduced sherds make up 19.90%, and sherds with the oxidizing/reducing firing conditions represent more than half, with 58.6% of the total. 22.2% of the sherds have polished surfaces with oxidizing firing conditions while, with reducing firing, the figure rises to 77.8%.

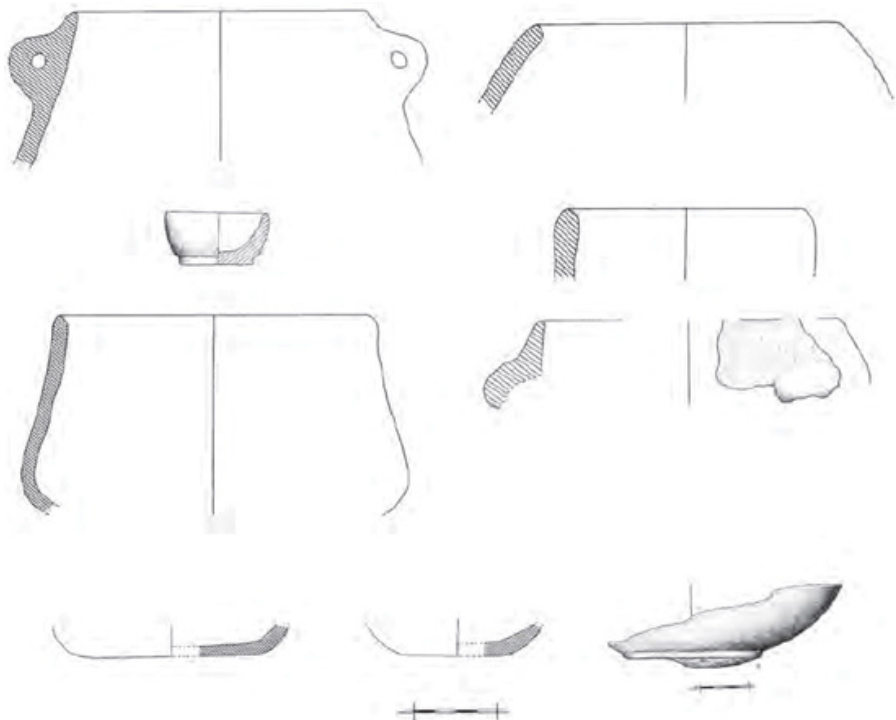


Fig.4.16 Main shapes of vegetable tempered vessels at Tell Halula.

The group with mineral inclusions has been separated into five main types: sherds with smoothed surfaces and small (31.9%), medium (36.2%) or large (31.9%) inclusions, with light coloured, brown, grey or orange surfaces; sherds with polished surfaces and small (32.8%) or medium (58%) inclusions; some BFBW sherds; sherds with small or medium calcite inclusions (Fine Black Series); and sherds with large calcite inclusions (Fig. 4.17).

X-ray fluorescence, petrographical and mineralogical analyses have confirmed the deliberate addition of ground calcite (the most common mineral inclusion at 70% of the total). The presence of other macroscopically visible minerals might be the result of selecting clays with these minerals or might be clays with these minerals deliberately added (basalt 26%, mica 2% and quartz 2%). Due to the lack of conclusive studies, we will only talk here about the pots with added calcite grains. The presence of volcanic rocks in some of the fragments makes it difficult to discern the origin or place of manufacture.

The most characteristic shapes of the mineral tempered vessels are small sized, closed bowls and vertical, straight sided, open bowls with handles. Wall thickness goes from 7 to 18 mm (Fig. 4.18):

Reducing firing conditions are dominant in this early ceramic

assemblage, although oxidizing and reducing/oxidizing conditions are also present (Fig. 4.19).

As we have seen already, the Black Series dominate within the group of ceramics with mineral inclusions. This series represents 52% of the total in Phase 1, which therefore characterizes this phase. The Black Series is a homogeneous production group whose main characteristics are calcite inclusions, as well as a dark grey or black colour giving it a characteristic appearance (Faura 1996a). The manufacture of this series, fired at less than 800 °C, provides the best conditions to resist thermal shock when used for cooking.

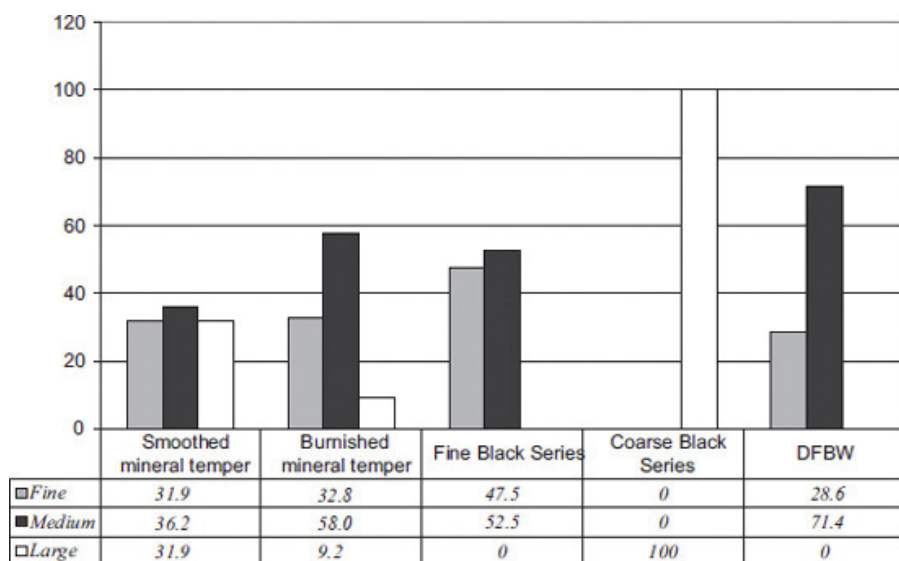


Fig.4.17. Tell Halula ceramic categories with mineral inclusions (size and percentages).

According to the quantity and size of the calcite inclusions, we can distinguish two groups: the Coarse Black Series, representing 31% of the total, and the Fine Black Series, with 18%. The most frequent finishing treatment is burnishing on the external and smoothing on the internal surfaces (Fig. 4.20).

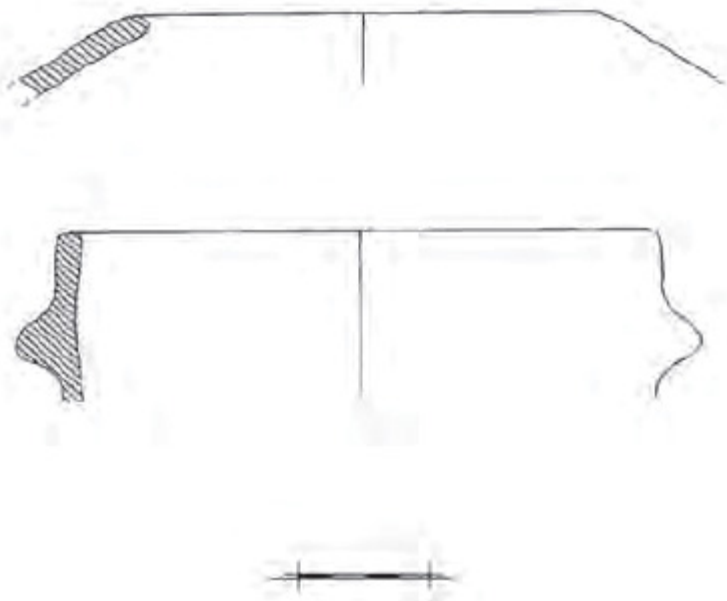


Fig.4.18 Mineral tempered vessel shapes at Tell Halula.

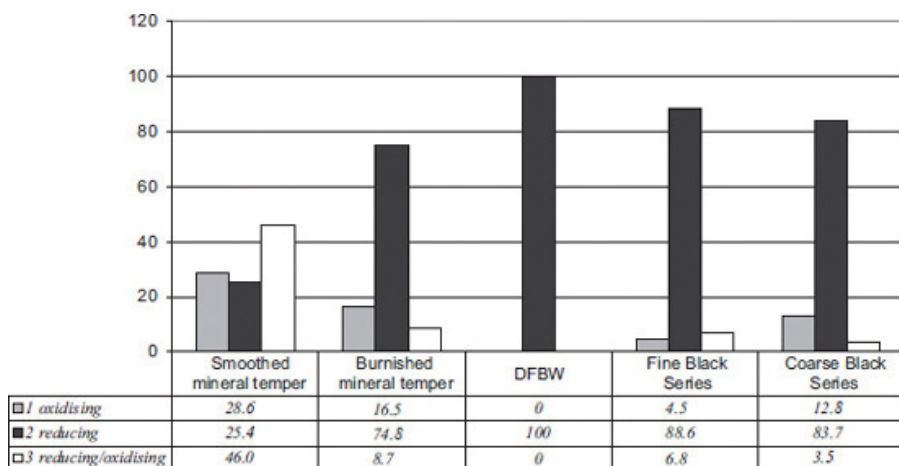


Fig.4.19 Firing conditions for each ceramic category at Tell Halula.

The main shapes are open bowls with straight sided walls and diameters ranging from 120 to 300 mm, while wall thickness goes from 5 to 25 mm. Also present are closed, spherical bowls with convex walls, bowls with rounded rims and rounded ledges, and some bowls showing plain bases with no inflexion point (Figs. 4.21–22).

Conclusions

First of all we would highlight that both Akarçay Tepe and Tell Halula

show a stratigraphical sequence without any break between the last stages of the late Pre-Pottery Neolithic B and the first Pottery Neolithic horizon, which saw the appearance of a technically complex first pottery production. The acquisition of ceramic technology is without doubt a progressive phenomenon, which implies a previous knowledge of diverse techniques. The control of firing conditions and modeling of the clay are techniques already well known in the earlier Pre-Pottery horizons, allowing the manufacture, from the very beginning, of high quality vessels.

The inclusions observed in the pottery of both sites show a dominance of calcite grains added to the fabric although other types of mineral and plant temper are also present. At the site of Akarçay Tepe, we still do not have the results of thin sections analysis but at Tell Halula the results obtained to date seem to confirm that the Black Series vessels (with calcite) could have been made locally (Faura 1996a).

Until now, the mode of production of the earliest pottery observed at both sites doesn't seem related to a simple technology but rather to belong to an incipient stage of specialization, having as its main characteristic different technological features such as types and proportions of tempers, firing conditions and surface treatments with a high uniformity. In that sense, the standardization of paste and the limited set of shapes may reveal some form of low-level, informal specialization.

It remains difficult to attribute function to these first pottery vessels. The limited typological variation, based on straight sided, closed bowls with slightly convex or flat bases, could be produced with the objective of manipulating or transforming food by boiling as they would resist thermic shock, but unfortunately very few examples show direct evidence of this activity. Archaeozoological analysis informs us that bones showing traces of boiling were already present prior to the invention of pottery, although in small numbers. No precise data is available from Akarçay Tepe or Tell Halula to show proportions of boiled bone remains from the PPNB phases in relation to the early pottery phases but, in any case, the possibility of a new technology allowing standardisation in cooking seems plausible.

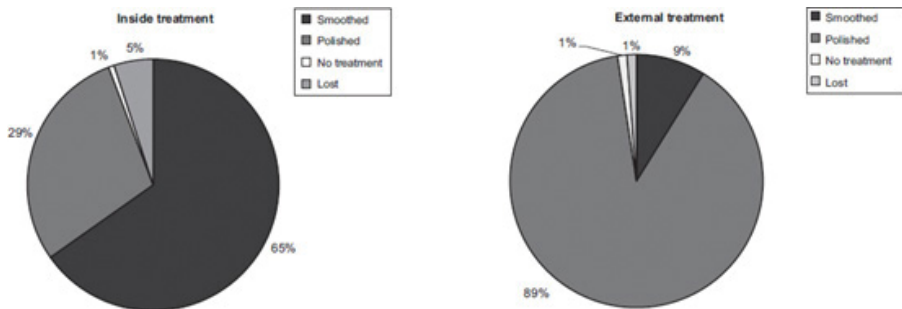


Fig. 4.20 Surface treatment of the Black Series at Tell Halula.

When talking about pottery properties which can resist thermic shock, we do have to accept that they are basically fabrics that have had a variable amount of mineral temper added that enables it, during its use in cooking conditions, to absorb the structural variations caused by variable temperature conditions. At the same time these pots, while resistant to fire, are also fragile and easily subject to mechanical cracking so they must have been treated with considerable care.

In its beginnings, pottery making could represent a prestige technology and the vessels obtained, made on a diverse range of clays but with similar shape, could have been considered as prestige items.



Fig.4.21 Characteristic Black Series straight sided bowl from Tell Halula.

Chronologically, the short series of ^{14}C dates available confirm that the first pottery vessels appear at both sites in the first quarter of the

7th millennium cal. BC, in a time frame quite similar to other sites which also see the first production of ceramics with similar characteristics.

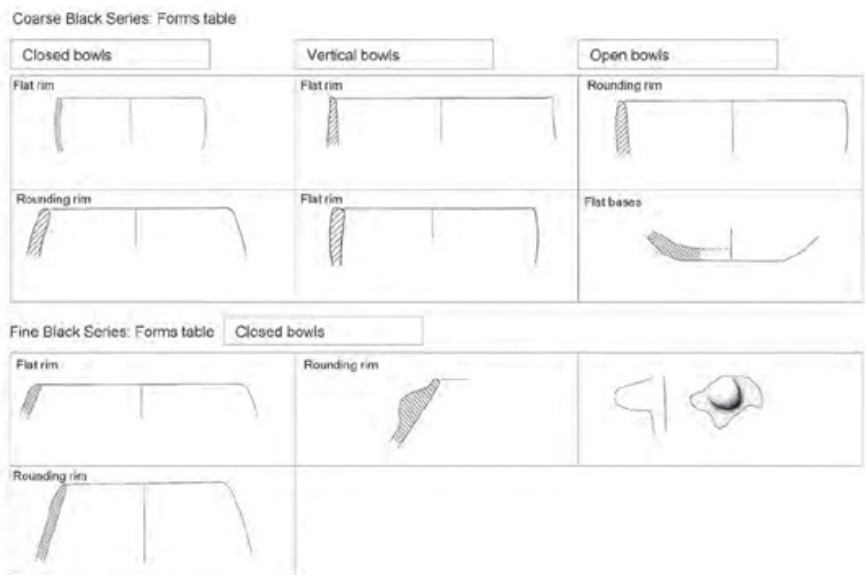


Fig.4.22 Black Series shapes from Phase 1, Tell Halula.

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Chapter 5

The Oldest Neolithic Pottery from Tell Seker al-Aheimar, Upper Khabur, Northeastern Syria

Yoshihiro Nishiaki and Marie Le Mière

Introduction

The Pottery Neolithic entity long considered to be the oldest in Upper Mesopotamia is known as the Proto-Hassuna (Le Mière 2000; Matthews 2000; Anatasio et al. 2004). This pottery, known by a variety of names, including the Neolithic Hassuna (Lloyd and Safar 1945), Sotto (Bader 1993), Umm Dabaghiyah (Kirkbride 1982) and Hassuna Ia pottery (Matsutani 1991), shared a major techno-stylistic feature, that is the common production of coarse, plain, plant-tempered pottery with carinated shapes and plastic decoration. This pottery assemblage, dating to the early 7th millennium cal. BC (Matthews 2000; Aurenche et al. 2001; Anatasio et al. 2004), has been repeatedly recovered from the basal levels of mound sites in Upper Mesopotamia (cf. Campbell and Baird 1990; Le Mière and Picon 1998).

This text-book view, which was primarily based on evidence from northern Iraq available by the 1990s, has been extensively revised following research developments in the last decade. First, the Proto-Hassuna entity can no longer be dated to the early 7th millennium cal. BC. Newly obtained radiocarbon dates for the typical Proto-Hassuna levels at Telul eth-Thalathat II in Iraq and Tell Kashkashok II in Syria have assigned this entity to a window spanning the middle to late 7th millennium cal. BC (Nishiaki and Le Mière 2005). Second, excavations in the upper Khabur basin of Syria yielded a previously unknown early Pottery Neolithic entity, characterized by the manufacture of mineral-tempered pottery. Provisionally designated as ‘Pre-Proto-Hassuna’, this entity was recovered at Tell Seker al-Aheimar below the Proto-Hassuna levels and radiocarbon dated to the early 7th millennium cal. BC (Nishiaki and Le Mière 2005). The recovery of more or less comparable mineral-tempered pottery assemblages in other regions of the Fertile Crescent such as the Upper Euphrates, Balikh valley, Upper Tigris and even the northern Levant (this volume) suggests that this entity belongs to a very early supra-regional Pottery Neolithic tradition. While it is still unknown how far

east this tradition extended, a recent survey has shown that its occurrence in the Khabur basin is more common than previously thought (Nieuwenhuyse and Wilkinson 2008; Le Mière 2013a).

Therefore, Pre-Proto-Hassuna pottery is the central focus of current research on the oldest Neolithic pottery in Upper Mesopotamia (Le Mière 2013a, b). In understanding the origin and developments of the oldest pottery, the archaeological evidence from Tell Seker al-Aheimar holds primary importance. This is because it is one of the few sites in which the stratified succession of Pre-Proto-Hassuna to Proto-Hassuna pottery assemblages has been documented. Moreover, Seker al-Aheimar is the only site that yielded Late Pre-Pottery Neolithic B (hereafter PPNB) cultural levels below these two distinct Pottery Neolithic levels. This unique stratigraphic occurrence distinguishes Seker al-Aheimar as key to investigating the origin and developments of the early Pottery Neolithic in Upper Mesopotamia. In this chapter, we summarize current knowledge on the oldest Neolithic pottery at this site (Nishiaki and Le Mière 2005, 2008; Le Mière 2013a; Le Mière and Bader 2013). More specifically, we summarize the techno-stylistic characteristics and archaeological contexts of the oldest Neolithic pottery at Seker al-Aheimar. The relationship of the Pre-Proto-Hassuna and the Proto-Hassuna is also discussed.

The Neolithic excavations at Tell Seker al-Aheimar

The archaeological mound of Tell Seker al-Aheimar is situated on the right bank of the Khabur River, approximately 45 km northwest of Hassake (Fig. 5.1). It covers an oval area of 300×180 m and rises approximately 11 m from the surrounding field. This mound was recognized as a Neolithic site during a reconnaissance survey in 1991 (Nishiaki 1992, 2000a) and excavations started in 2000 under the auspices of the University of Tokyo (Nishiaki 2012 and references therein). Excavations over the 11 subsequent seasons have taken place in five areas or sectors, mostly distributed along the mound's northern slope (Fig. 5.1). Three of them, Sectors A (63 m²), C (500 m²) and E (253 m²), comprise the major excavation areas, whereas the other two, B (32 m²) and D (12 m²), remain limited to sounding pits.

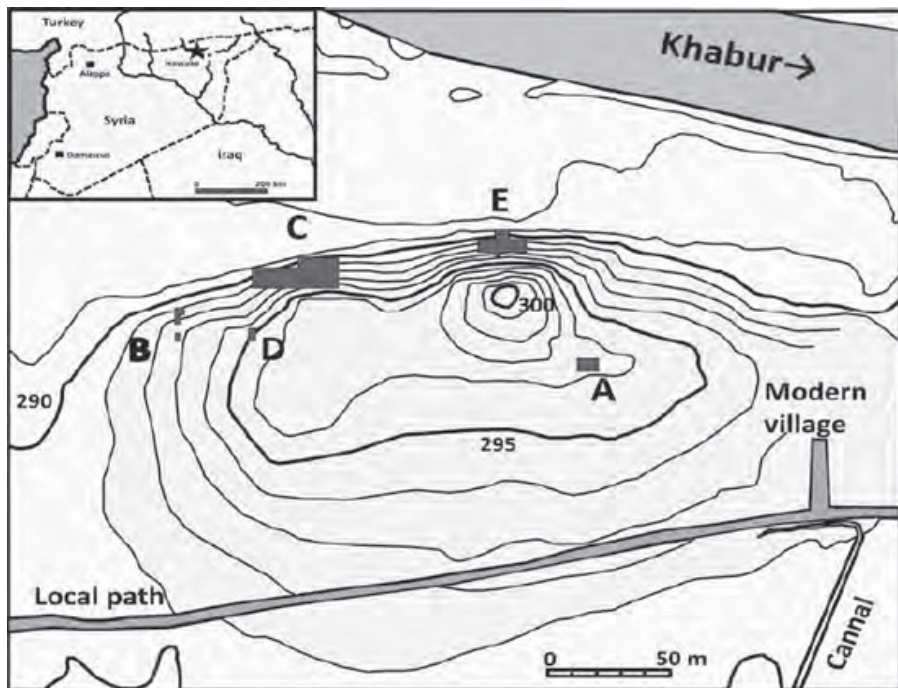


Fig.5.1 Map showing the location of Tell Seker al-Aheimar and the areas excavated in 2000–2010.

Despite the different horizontal scales, all sectors were excavated down to virgin soil. As a result, they exposed rich Neolithic cultural deposits below thin levels of the Chalcolithic period. Moreover, all sectors showed virtually the same Neolithic cultural succession: Late PPNB levels on virgin soil, followed by the Pre Proto-Hassuna and then Proto-Hassuna levels (Figs. 5.2–3). In addition to the wide distribution of Neolithic artifacts on the surface, this stratigraphic succession indicates that the settlement was quite extensive during the Neolithic period, occupying an area of at least 4.5 ha. Consequently, Tell Seker al-Aheimar is regarded as one of the largest Neolithic settlements known in the Khabur basin and further east.

A number of radiocarbon dates for the Neolithic levels of Tell Seker al-Aheimar have been published (Nishiaki and Le Mièrè 2005, 2008; Nishiaki 2007a). Most of them are for the Late PPNB and Pre-Proto-Hassuna phases and the boundary between them can be drawn at around 6800–6700 cal. BC. Unfortunately, only one date is available for the Proto-Hassuna phase. Nevertheless, it perfectly matches with the series of dates for the Proto-Hassuna levels of Telul-eth Thalathat II and Kashkashok II (Nishiaki and Le Mièrè 2005). The transition from the Pre Proto-Hassuna to Proto-Hassuna is estimated to have taken place at approximately 6600–6500 cal. BC. Accordingly, the

Pre-Proto-Hassuna or the oldest Pottery Neolithic entity of Tell Seker al-Aheimar can be placed within a period of the second quarter of the 7th millennium cal. BC.

The oldest pottery from Tell Seker al-Aheimar

Pre-Proto-Hassuna

The oldest pottery consisted of a small amount of sherds (Figs 5.4 and 5.5). To date, no complete vessels have been recovered. Its most distinct techno-stylistic feature is the heavy use of mineral temper. This is in remarkable contrast to the common use of plant temper in the Proto-Hassuna pottery industry. Additional features are also notable. For example, the variety of shapes is very limited (Fig. 5.6). Closed or holemouth jars with convex bodies and large flat bottoms are typical forms, with very regular rims having a flat top. The surface is never decorated but is well-burnished. The jars occasionally have a pair of horizontal (Fig. 5.6: 4, 6) or vertical lugs (knobs) (Fig. 5.6: 7) attached to the upper part of the body. Vertical lugs are often pierced.

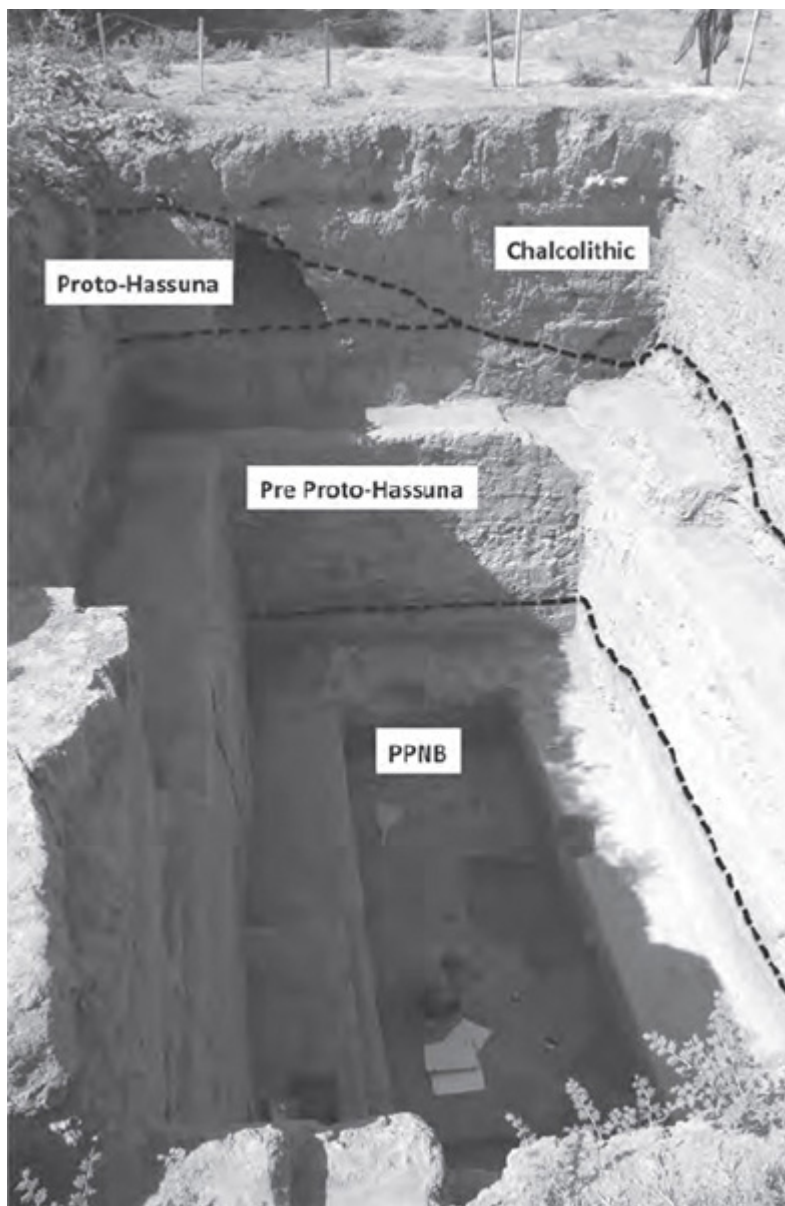


Fig.5.2 The excavation trench in Sector A, Tell Seker al-Aheimar.

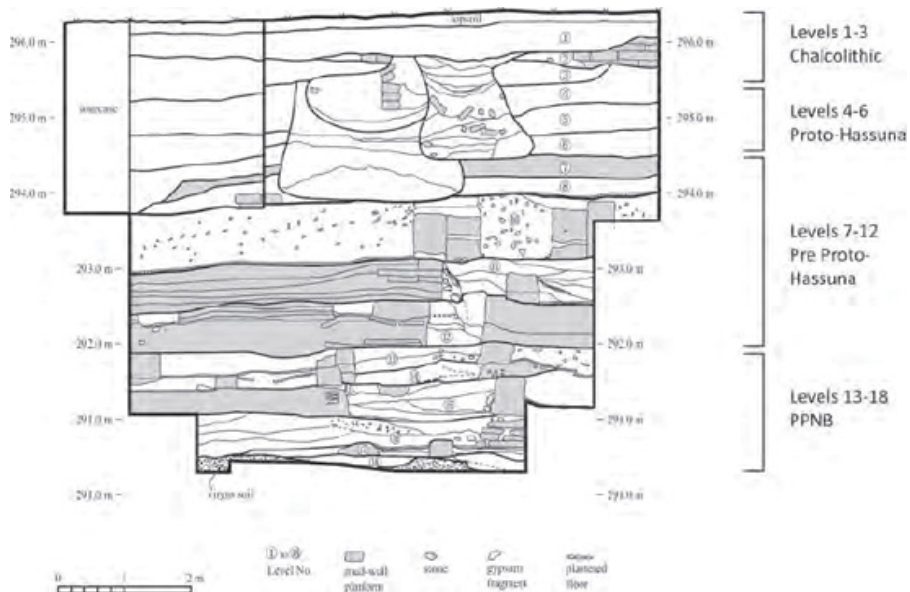


Fig.5.3 Stratigraphy of the south wall of Sector A, Tell Seker al-Aheimar (modified from Nishiaki and Le Mièrre 2008).



Fig.5.4 Early Dark Ware from Tell Seker al-Aheimar. Left: exterior surface; right: interior surface.



Fig.5.5 Basalt-Tempered Ware from Tell Seker al-Aheimar. Top: exterior surface; bottom: interior surface.

While sharing these basic features, the pottery apparently represents two major wares: ‘Early Dark Ware’ (Figs 5. 4 and 5. 6: 1–4) and ‘Basalt-Tempered Ware’ (Figs 5.5 and 5.6: 5–8), distinguishable mainly by the specific types of temper and also by the color of paste (Nishiaki and Le Mièrre 2005, 2008). The temper of Early Dark Ware is

white-coloured, mostly volcanic (volcanic carbonatite) and occasionally limestone (Fig. 5.4). The colour of the surface and paste is dark grey or black. In contrast, the paste for Basalt-Tempered Ware contains numerous basalt inclusions, which are sometimes very large, up to several millimetres in diameter (Fig. 5.5). The surface colour ranges from dark grey beige, reddish-brown to dark brown. The Basalt-Tempered Ware, unlike Early Dark Ware, developed a little later with new shapes such as carinated and concave ones, and also some painted decoration (see below).

Both of these two wares occurred together in the earliest Pottery Neolithic levels of all sectors. While Basalt-Tempered Ware was consistently more common than the Early Dark Ware, the total amount of pottery overall was very small. For example, in Sector A, which contained six architectural levels of the Pre-Proto-Hassuna phase (Fig. 5.3; Levels 7–12), the number of sherds in each of the first four levels was less than 100. It started to rise slightly in Level 8 and increased to several hundred sherds in Level 7. The consistent pattern of small quantities of pottery in the oldest levels and a sharp increase in the latest levels is quite noteworthy. The number of architectural levels and the duration of occupation indicated by radiocarbon dates suggest that each architectural level represents a time period of roughly 20–30 years, or one generation of Neolithic inhabitants. If so, a household in the early phase possessed less than one-tenth of the pottery possessed by one in the later Pottery Neolithic. This situation continued over many generations. The socioeconomic meaning of pottery must have been significantly different between these cultural phases.

The occurrence of Pre-Proto-Hassuna pottery marks the beginning of the Pottery Neolithic at Seker al-Aheimar. However, the introduction of the first pottery did not coincide with recognizable changes in other cultural aspects. For example, the settlement layout did not change at Seker al-Aheimar with the introduction of pottery. In Sector A, the characteristic PPNB architecture built on a platform (Fig. 5.7), as well as other architecture in Level 15, continued to exist almost in the same position until Level 10 of the Pre-Proto-Hassuna (Fig. 4.3). The pattern of using space in households also remained the same (Kadowaki et al. 2013). Furthermore, the lithic industry does not indicate any abrupt change at the beginning of the Pre-Proto-Hassuna. A number of changes related to raw material use, blank production technology and composition of specific tool types did occur in the Late PPNB and afterwards (Nishiaki 2000b). However, these changes began within the later part of the Late PPNB before the introduction of

pottery (Nishiaki 2011). A fine example is seen in the changing patterns of a particular obsidian tool group called corner-thinned blades (Fig. 5.8). The ‘Balikh type’ of corner-thinned blades common in the Late PPNB was gradually replaced by the ‘Kashkashok type’ in the Proto-Hassuna phase (Nishiaki 2008). The start of this change does not correspond with the onset of the Pre-Proto-Hassuna phase. A similar case is evident in other aspects of material culture. For instance, the production of white ware, which is often related to early pottery production technology, was already common in the Late PPNB, before the beginning of the Pre-Proto-Hassuna phase (Kume 2013).

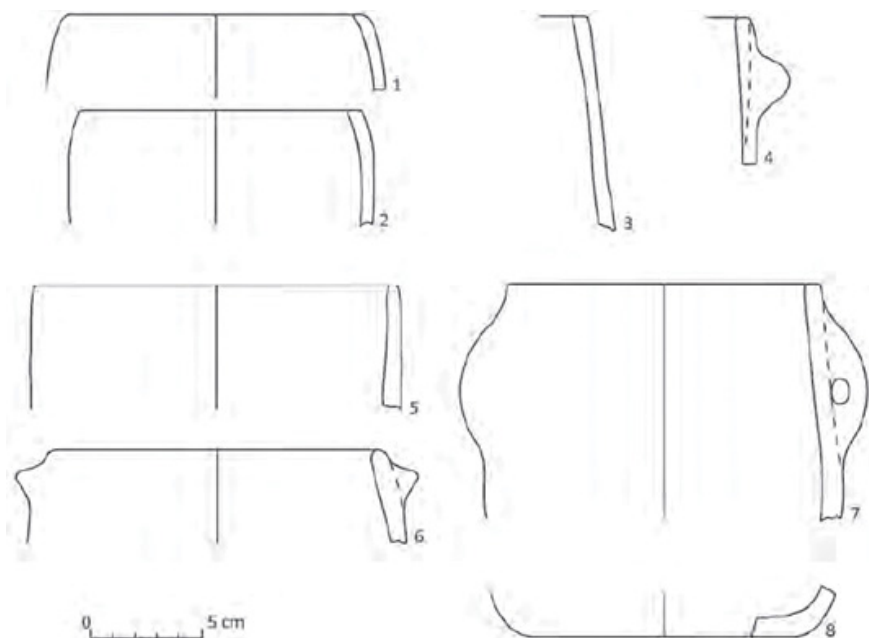


Fig.5.6 Early Pre-Proto-Hassuna pottery from Tell Seker al-Aheimar. 1–4: Early Dark Ware; 5–8: Basalt-Tempered Ware.

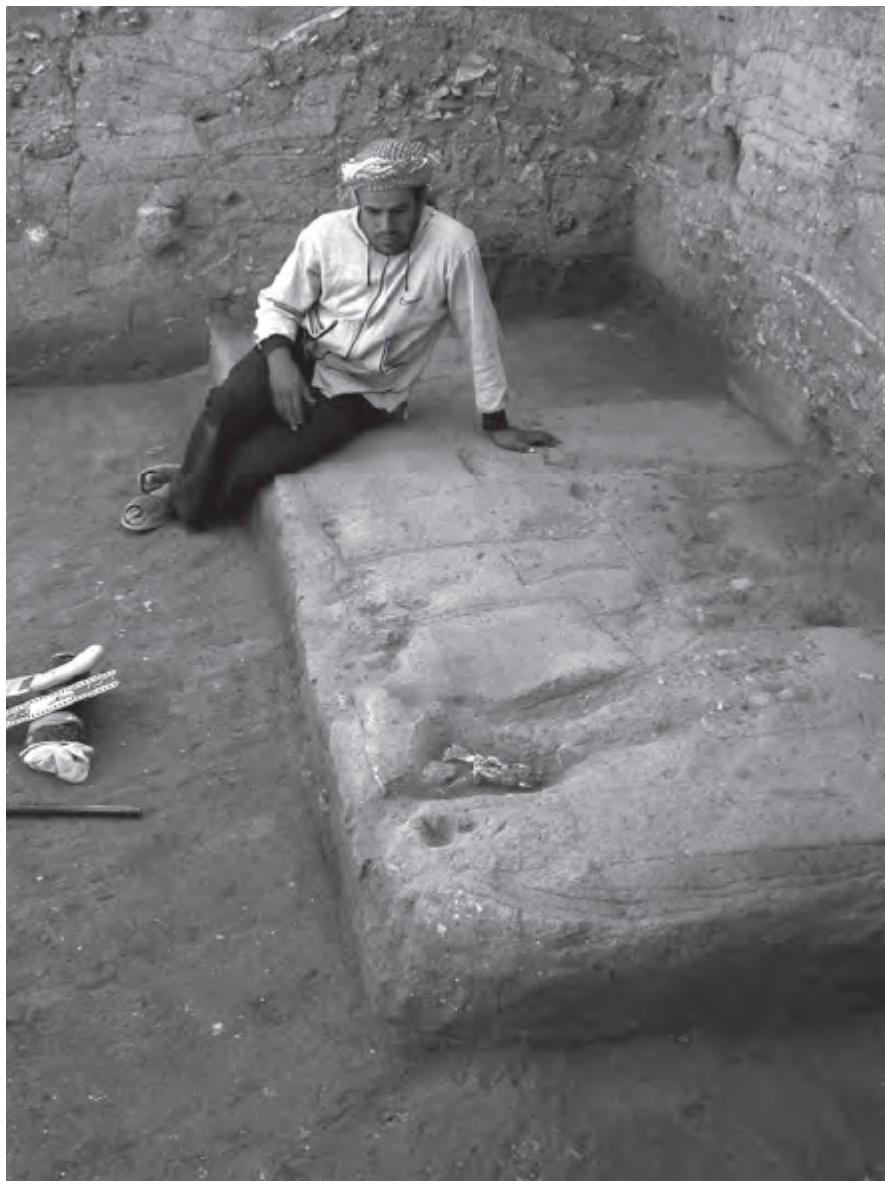


Fig.5.7 Mud brick architecture in Level 15 of Sector A (Late PPNB), Tell Seker al-Aheimar.

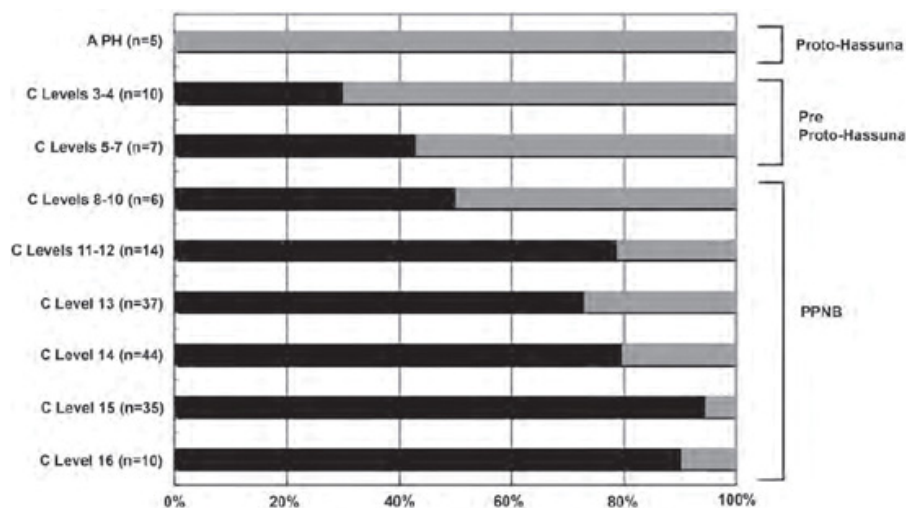


Fig.5.8 Changes in types of obsidian corner-thinned blades from the Late PPNB to the Proto-Hassuna at Tell Seker al-Aheimar (modified from Nishiaki 2008). Black bar: Balikh type; Grey bar: Kashkashok type.

The first pottery appeared in the later stages of cultural change from the PPNB to the Pottery Neolithic. In other words, the Pre-Proto-Hassuna phase represents the later part of this transitional period. It was the local PPNB community who first adopted the use of pottery at Seker al-Aheimar. There is no evidence for the intrusion of any foreign community in this time period, although it remains unclear whether the first pottery at Seker al-Aheimar was locally manufactured or imported. Mineral-tempered pottery comparable to that of Seker al-Aheimar is distributed across other regions such as the Upper Euphrates and Balikh valleys (this volume). In this regard, it is important to note that its distribution crosscuts existing boundaries of regional cultural traditions among PPNB societies (Le Mière 2013b). Two major cultural provinces have been recognized at the latest stage of the PPNB: ‘the East and West Wings of the Fertile Crescent’, the boundary of which lies between the Balikh and Khabur valleys (Kozłowski 1999; Kozłowski and Aurenche 2005). The two provinces exhibit sharp contrasts in local lithic technology. Blade production using double-platform core technology was popular in the west, whereas the eastern technology was characterized by blade production through pressure-flaking single-platform cores. The PPNB lithic industry of Seker al-Aheimar undoubtedly belongs to the eastern tradition, which is testified by its series of bullet-shaped pressure blade cores and the complete absence of double-platform cores (Nishiaki 2007b, 2013). However, a small number of blade tools made from double-platform cores do exist. Those blade tools were obviously

imported, since they were manufactured from fine-grained flint of chocolate brown or purple colour that is exotic to the Khabur. These artifacts indicate that consistent social contact existed between the Khabur community and others in the west, which would explain the supra-regional similarities seen in the oldest pottery.

Pre-Proto-Hassuna to Proto-Hassuna

As previously noted, the oldest pottery at Seker al-Aheimar consisted of Early Dark Ware and Basalt-Tempered Ware. These were gradually replaced by new types of wares and eventually a new pottery industry known as the Proto-Hassuna was established. The process of their replacement is defined by stratigraphic evidence in Sector A (Nishiaki and Le Mière 2008). Early Dark Ware, which was rare from the beginning, disappeared first in the late Pre-Proto-Hassuna (Level 8). Basalt-Tempered Ware started to give way to a new ware in the same level. The temper of the latter now contained plant material as well. Thus, the Basalt-Tempered Ware was transformed into the Basalt-and-Plant-Tempered Ware. The shape and surface treatments of this new ware were principally the same as before (Fig. 5.9), but lugs were more varied and the more elaborated features already present on Basalt-Tempered Ware, such as carinations and concave bodies (Fig. 5.9: 5), became more common. Painted decorations also appeared (Fig. 5.9: 6). The transformation of Basalt-Tempered Ware to Basalt-and-Plant-Tempered Ware proceeded quite rapidly. By the subsequent Level 7, Basalt-Tempered Ware had completely disappeared.

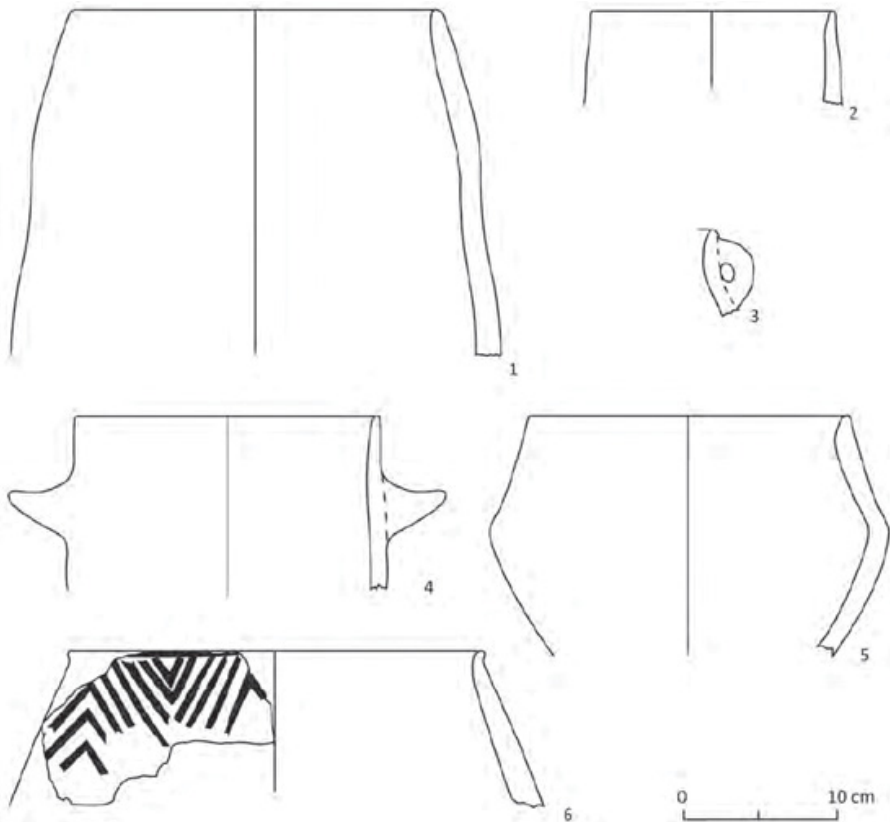


Fig.5.9 Late Pre-Proto-Hassuna pottery from Tell Seker al-Aheimar. 1–6: Basalt-and-Plant-Tempered Ware.

Along with this change, new wares joined the pottery inventory of the latest Pre-Proto-Hassuna phase (Levels 8 and 7): Plant Tempered Ware (Fig. 5.10: 1–5), which became dominant in the Proto-Hassuna; and Fine Mineral Ware (Fig. 5.10: 6–7), which was fine pottery with small mineral inclusions. The quantity was very small in Level 8, but these new wares outnumbered the Basalt-and-Plant-Tempered Ware in Level 7. Basalt-and-Plant-Tempered Ware then became rare at the start of the Proto-Hassuna phase (Level 6) and soon disappeared. At the same time, another type known as Grey-Black Ware appeared in significant quantities.

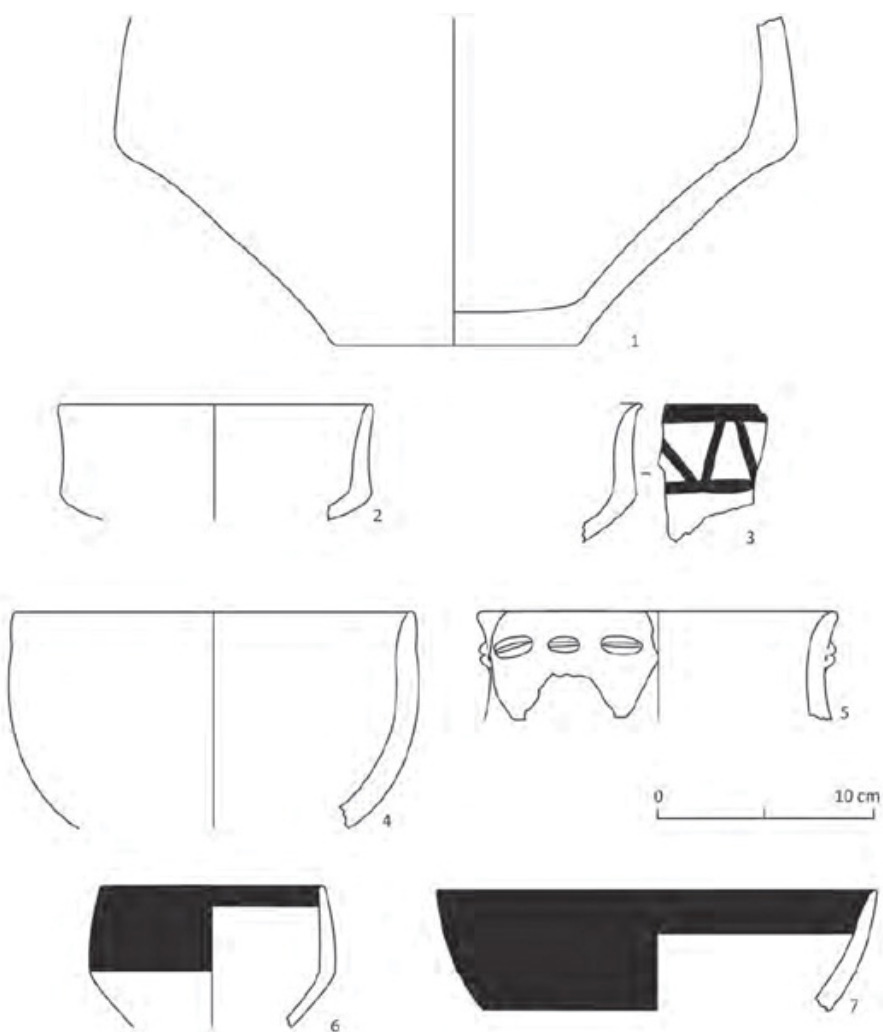


Fig.5.10 Proto-Hassuna pottery from Tell Seker al-Aheimar. 1–5: Plant-Tempered Ware; 6–7: Fine Ware.

These stratigraphic observations show that the Pre-Proto-Hassuna is divisible into two stages. The earlier stage persisted longer (Levels 12 to 9), during which the use of a small amount of Early Dark Ware and Basalt-Tempered Ware continued. The second, shorter stage (Levels 8 to 7) represents a period of major changes: Early Dark Ware disappeared, Basalt-Tempered Ware transformed into the Basalt-and-Plant-Tempered Ware and new types such as Plant-Tempered and Fine Mineral Wares appeared. Basalt-and-Plant-Tempered Ware was soon replaced by Plant-Tempered and Fine Mineral Wares. Its disappearance coincides with the beginning of the Proto-Hassuna (Level 6). In short, this succession denotes replacement processes of the early mineral-tempered wares of the Pre-Proto-Hassuna by the

plant-tempered one of the Proto-Hassuna (Fig. 5.11).

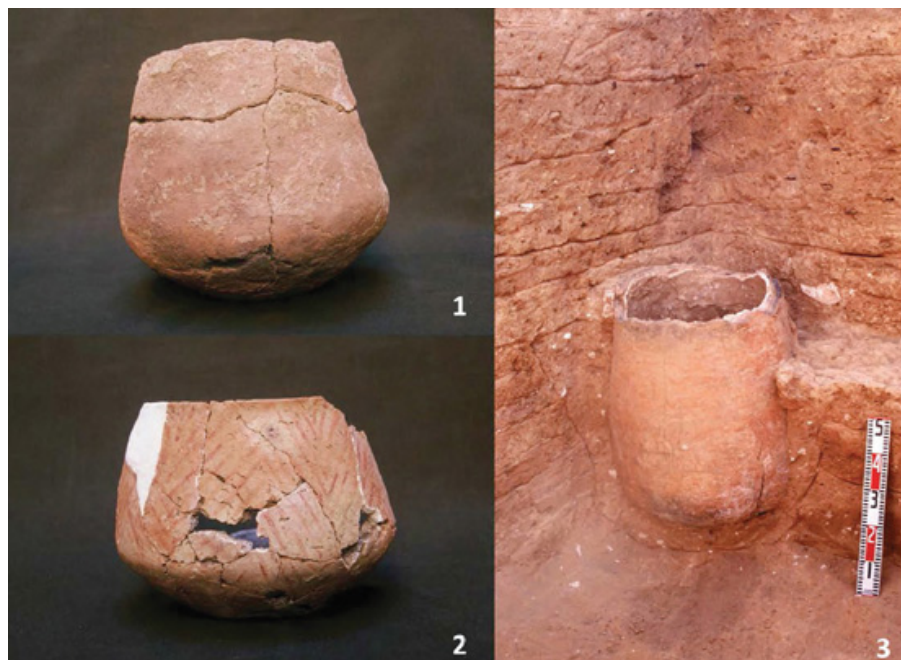


Fig.5.11 Examples of complete pottery vessels from the Proto-Hassuna phase from Tell Seker al-Aheimar.1: Unpainted pot; 2: Painted bowl; 3: Large storage vessel in situ.

Continuity is evident in the pottery and its archaeological contexts at Tell Seker al-Aheimar, Syria. The pottery reflects at least a manufacturing tradition from the Pre-Proto-Hassuna to Proto-Hassuna. At the same time, evidence from Seker al-Aheimar shows that general architectural and material culture features of the Pre-Proto-Hassuna were more similar to the PPNB than to the Proto-Hassuna. We have already mentioned the continuity in architecture of the Late PPNB to Pre-Proto-Hassuna in Sector A. The architecture of the Proto-Hassuna levels is different. The buildings became less robust and were built with *pisé* instead of mud bricks. Furthermore, the extensive use of gypsum plaster in the Late PPNB and Pre-Proto-Hassuna was less popular in the Proto-Hassuna. These architectural changes apparently started during the latest Pre-Proto-Hassuna phase (Nishiaki and Le Mièvre 2008).

The cultural contrasts often pointed out between the Pre-Pottery and Pottery Neolithic in Upper Mesopotamia are practically those observed between the Pre-Pottery Neolithic and the Proto-Hassuna periods. As a matter of fact, those contrasts were defined when the Proto-Hassuna was thought to have directly followed the PPNB in this region (Matthews 2000; Nishiaki 2000b). The discovery of Pre-Proto-

Hassuna pottery and its cultural assemblages enabled a more precise definition of the transitional processes; the Pre-Proto-Hassuna represents the latest transitional phase. The beginning of the Proto-Hassuna is therefore regarded as the end of the transition to a new Neolithic society, otherwise known as the Late Neolithic. At this stage, pottery undoubtedly played an important role in the cultural system, considering the co-occurrence of changes at the end of the Pre-Proto-Hassuna along with the rapid increase in pottery use and the variety of wares as well as the introduction of plant-tempered pottery.

Summary and conclusions

This paper has reviewed results from our research on the oldest Neolithic pottery and its archaeological contexts at Tell Seker al-Aheimar, Syria. The pottery reflects at least three chronological stages of development: the first two belong to the Pre-Proto-Hassuna and the last one to the Proto-Hassuna. The first and longest stage is characterized by the use of a small amount of mineral-tempered pottery. The second stage represents a period of rapid changes, in which the earlier mineral-tempered ware evolved into new mineral- and plant-tempered and plant-tempered wares. Finally, the third stage is defined by the establishment of the Proto-Hassuna tradition. This well-known tradition comprised a new set of techno-stylistic features, including the common use of plant-tempered pottery and fine wares and the far more frequent production of pottery in general.

The interface period between the Pre-Pottery and Pottery Neolithic experienced a range of changes in material culture as well as the subsistence economy, settlement patterns and social organization. These changes began in the Late PPNB and the oldest pottery came into use as one of the later additions to numerous elements constituting these changes. In contrast, the shift to the next stage was quite different. It corresponded to a period of swift changes resulting in the new Proto-Hassuna cultural phase, in which pottery began to play a more significant and most likely different socioeconomic role than before. The pattern defined in this paper, which indicates that the socioeconomic role of the oldest pottery changed over the course of only a few centuries, clearly should be interpreted within the broader context of Neolithisation in Upper Mesopotamia. The rich archaeological record and solid stratigraphic evidence from Tell Seker al-Aheimar certainly provides a unique opportunity for further analysis that will allow us to construct adequate models for understanding this significant period in the human past.

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Chapter 6

The Earliest Pottery of Salat Camii Yanı

Yutaka Miyake

Introduction

The Neolithic cultures in the Anatolian Tigris valley were virtually unknown for a long time. However, with the recent progress of the rescue activities in the Ihsu Dam reservoir area, good evidence for this period has been rapidly accumulating. Salat Camii Yanı, one of the Neolithic sites in the Ihsu Dam reservoir, has been excavated by a joint Japanese-Turkish archaeological mission since 2004 ([Fig. 6.1](#)).

Site and stratigraphy

All the deposit, with a total depth of 4.5 m above the virgin soil, belongs to the Neolithic period, while a number of storage pits dating to the Iron Age and Islamic period were also found. The Neolithic layers have been grouped into three phases mainly based on the preliminary analysis of the pottery: Phase 1, Phase 2 and Phase 3 from the earliest to the latest. Unfortunately no evidence was obtained for a Pre-Pottery Neolithic occupation.



Fig.6.1 General view of Salat Camii Yanı

The new evidence from Salat Camii Yanı provides us with a relatively good sequence of the Pottery Neolithic, especially for its earlier part. It can be briefly summarized as a transition from mineral tempered burnished ware to plant tempered coarse ware and dates from the very beginning of the Pottery Neolithic to the 'Proto-Hassuna' period. The pottery of Phase 1, represented by mineral tempered and burnished ware, corresponds well to the earliest pottery groups attested at Akarçay Tepe, Mezraa Teleilat and Tell Halula in the Middle Euphrates valley, at Tell Sabi Abyad I in the Balikh and at Tell Seker al-Aheimar in the Khabur Basin. In Phase 2 this type of pottery was largely replaced by plant tempered coarse ware. Such a transition in the pottery assemblage also occurred almost simultaneously in upper Mesopotamia. The pottery of Phase 3 compares well to that of 'Proto-Hassuna' It includes carinated bowls, ogge form pots, husking trays, applied decoration and painted pottery. Thus the development of the pottery assemblage revealed at Salat Camii Yanı followed almost the same way as that in north Mesopotamia, indicating its close relationship with that region.



Fig.6.2 Mineral inclusions of the first ware group.



Fig.6.3 Light coloured pottery with black mottles.



Fig.6.4 Holemouth jar with ledge handles.

The earliest pottery of Salat Camii Yanı (Phase 1)

Ware groups

Almost all of the sherds in Phase 1 can be treated as mineral tempered and burnished ware but it is possible to divide them into several ware

groups mainly based on the traits of the fabrics. The most predominant and conspicuous group is characterized by a large amount of rather coarse and white coloured mineral inclusions, which make the fabrics somewhat brittle (Fig. 6.2). These inclusions are clearly visible on the broken edges of the sherds and interior surfaces. The second group contains a large amount of dark coloured and bright mineral inclusions. These inclusions, possibly pieces of schist, were crushed intentionally before being added to the clay. The third group includes fine particles of grits and the last group contains only a small amount of mineral inclusions. Although it is rather exceptional, some pieces of painted pottery were also found. Among the former three ware groups there are some sherds which contain plant inclusions, which are fairly fine and few in number.



Fig.6.5 Rim fragment with ledge handle.



Fig.6.6 Dark coloured band seen on the interior rim.

Surface treatment

The surfaces are not always smooth but are usually well burnished and lustrous. There is a general tendency for the exterior surfaces to be more carefully burnished than the interior surfaces.

Firing techniques

In general the pots were relatively well fired. The brittleness of the first ware group was probably not caused by inferior firing but because the fabrics were heavy with inclusions. Both light and dark tones are observed and the surface colours range from orange buff to dark grey. Dark coloured cores are not commonly seen and completely oxidized pieces are not rare. The black mottles occasionally observed on the exterior surfaces indicate that the pots were fired by open firing.

Vessel shapes

Generally the vessel shapes are rather simple (Figs 6.3 and 6.4). Deep and closed forms, such as deep bowls and hole-mouth jars, are common, while there are some open forms such as hemispherical bowls. The bases are usually flat. Among the closed forms a pair of horizontally elongated ledge handles is occasionally attached below the rims (Fig. 6.5). Horizontally pierced knob handles are also seen.

Trace of use

There are some examples which have dark coloured bands on the interior rims or on the upper-interior sides (Fig. 6.6). These bands look like carbon deposition caused by charring of food. If this is really the case, at least some pots were used for cooking or boiling of foodstuffs.

Culinary hypothesis on the origins of pottery

At Salat Camii Yanı more than one hundred fire pits or pit-hearths were found in the layers of Phase 1 and Phase 2 (Fig. 6.7). These cooking facilities generally have an elongated oval shape of variable dimensions. The walls are intensively burnt and have turned yellow or dark brown. In many cases burnt stones were found in situ and it is likely that specific kinds of stone which are heat-resistant or not easily damaged by heat, were carefully selected. The fire pits were filled with ash and charcoal, probably derived from wood, used as fuel. Their frequent occurrence indicates that cooking activities were repeatedly practiced in the same area and these pits were frequently abandoned and rebuilt.

Pit-hearths are commonly discovered in the period from the Natufian to the Pre-Pottery Neolithic, especially in the region from the Euphrates valley to the Zagros Mountains, as is well known from Mureybet, Cafer Hoyük and Jarmo.



Fig.6.7 Fire pit filled with burnt stones.

The new evidence from Salat Camii Yanı shows that pit-hearth cooking with the aid of the retained heat of stones continued even in the Pottery Neolithic. However, in the subsequent period, the latter half of the Pottery Neolithic, fire pits seem to have vanished, or at least become less popular compared to previous periods. A long tradition from the Natufian ended in the Pottery Neolithic period and significant change in the technique of cooking happened in the Pottery Neolithic.

The question is: why were these facilities abandoned at this point and by what were they replaced, if people continued to cook? The most feasible answer might be the emergence or the development of pottery production. As already discussed above, the general traits of the earliest pottery, or mineral tempered burnished ware, are eminently suitable for cooking. Mineral tempered fabric reduces thermal shock and ledge handles would be quite useful for gripping the vessels while they were still hot. If this was really the case, it means that the method of food processing shifted from roasting in pit-hearths to boiling in pots. Fire pits were eventually replaced by pottery, while both cooking methods coexisted for a while in the earlier half of the Pottery Neolithic.

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Chapter 7

The Emergence of Pottery in the Northern Levant: A Recent View from Tell el-Kerkh

Takahiro Odaka

Introduction

Recent excavations at Tell el-Kerkh, one of the Neolithic ‘mega-sites’ in West Asia, have provided plenty of important new data to examine the Neolithic culture in the northern Levant. One of the most notable discoveries in this series of campaigns is the so-called Kerkh Ware, named after the site where it was first found (Fig. 7.1; Tsuneki and Miyake 1996; Tsuneki et al. 1998; Miyake 2003). It brought new insights to the consideration of the development of pottery in West Asia, because this style can be seen as the oldest ware-type of pottery in the region. This paper aims to illustrate the early pottery manufacture in the northern Levant, including Kerkh Ware, based especially on the results of excavations at Tell el-Kerkh, and provide a tentative view of the emergence of pottery in West Asia.



Fig.7.1 Kerkh Ware, Tell el-Kerkh 2.

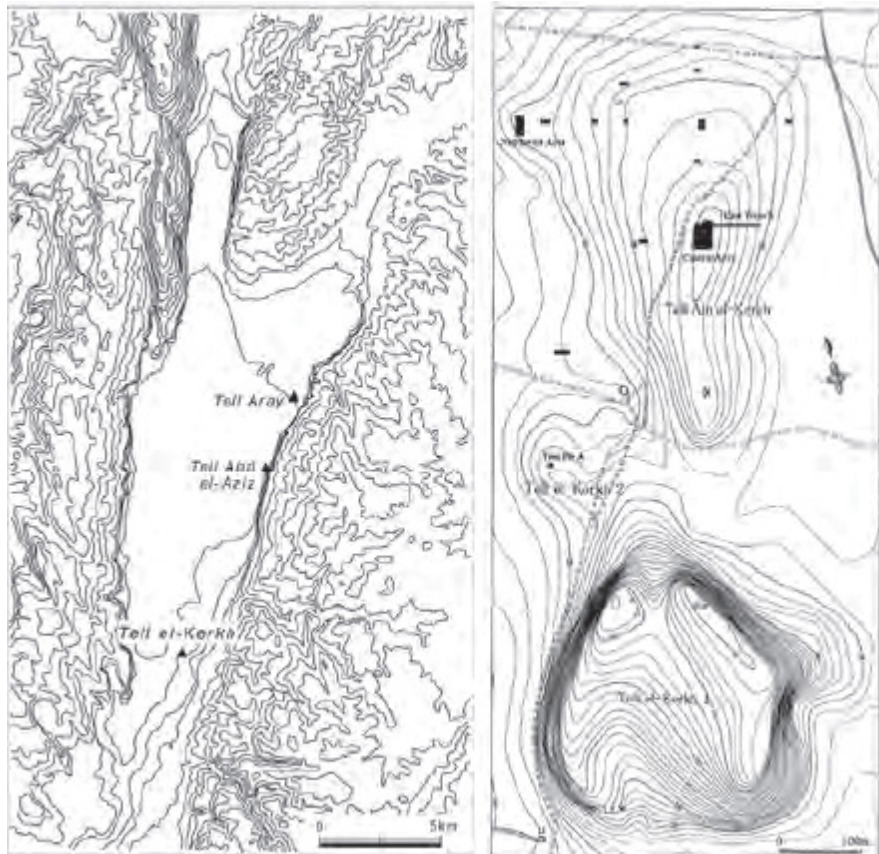


Fig.7.2 Map of the Rouj basin and Tell el-Kerkh.

Early pottery in northern Levant: The evidence from Tell el-Kerkh

Tell el-Kerkh, which consists of three mounds (i.e. Tell el-Kerkh 1, Tell el-Kerkh 2 and Tell Ain el-Kerkh), is situated in the southern part of the Rouj basin, northwestern Syria (Fig. 7.2). The University of Tsukuba expedition has conducted several seasons of field work in this basin since 1990 and proposed a local chronological framework, the so-called Rouj chronology, as one of the results (Iwasaki et al. 1995). The Pottery Neolithic corresponds to the Rouj 2 period in this chronology and can be divided into four sub-periods: Rouj 2a, 2b, 2c and 2d, from earliest to latest (Table 7.1). All specimens of Kerkh Ware have been recovered from cultural layers dated to the Rouj 2a or 2b periods; that is to say, it is peculiar to the early stage of the Pottery Neolithic. The whole pottery assemblage in the Rouj 2a and 2b periods can be summarized as follows.

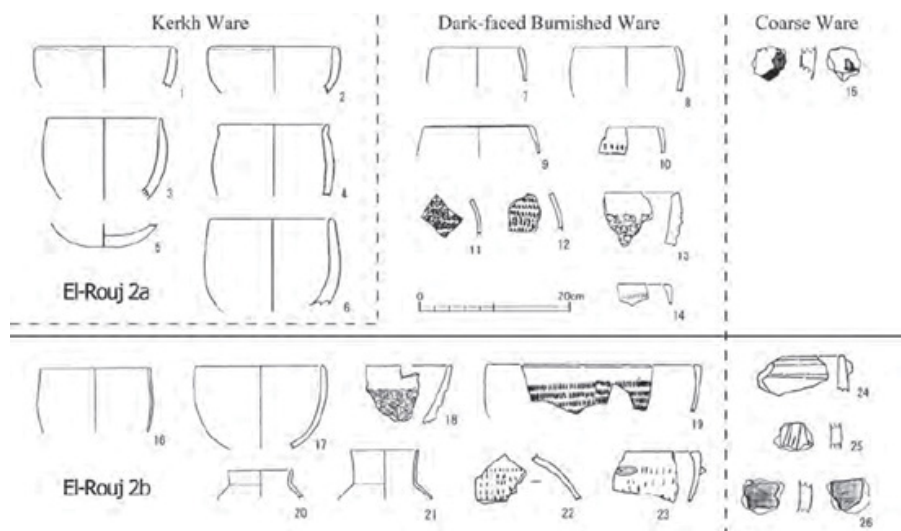


Fig.7.3 Pottery of Rouj 2a-2b periods, Tell el-Kerkh (Tsuneki et al. 1998: Fig. 11; Miyake 2003: Figs. 54-55, 57-58).

Period	Tell el-Kerkh				Tell Aray		Tell Abd el-Aziz	Radiocarbon dates (*unreliable)
	Test Pit A (92)	Central Area (97-02, 07-)	Northwest Area (98-02)	East Trench (05-08)	Step Trench (91-92)	Test Pit A (90)	Test Pit A (90)	
Rouj 2d		Phase I		3-1	21-18		18-?	Kerkh-Central Area, Phase I 6950±50b p.(NUTA2-2105) Kerkh-East Trench, layer 2 6815±20b p.(UCIAM5-21690) Kerkh-East Trench, layer 2 6980±30b p.(UCIAM5-21687) Kerkh-East Trench, layer 2 6985±25b p.(UCIAM5-21691) Kerkh-East Trench, layer 2 7460±25b p.(UCIAM5-21685)* Kerkh-East Trench, layer 3 6990±25b p.(UCIAM5-21688) Kerkh-East Trench, layer 3 7050±25b p.(UCIAM5-21692)
Rouj 2c				4	25-22	2-1		Kerkh-East Trench, layer 4 7125±25b p.(UCIAM5-21689)
				5		4-3		Kerkh-Central Area, Phase II 7230±40b p.(NUTA2-2104) Kerkh-Central Area, Phase II 7420±45b p.(NUTA2-2089) Kerkh-East Trench, layer 5 725±25b p.(UCIAM5-21696) Kerkh-East Trench, layer 5 7450±25b p.(UCIAM5-21693) Kerkh-East Trench, layer 5 7450±25b p.(UCIAM5-21697) Arzy-Test Pit A, layer 3 7410±245b p.(N-5978)
		Phase III		6		8-5		Kerkh-Central Area, Phase III 7670±45b p.(NUTA2-2023) Kerkh-Central Area, Phase III 7730±50b p.(NUTA2-2024) Arzy-Test Pit A, layer 6 8300±455b p.(N-5977)* Arzy-Test Pit A, layer 8 8290±145b p.(N-5976)*
		↓				(hiatus)		
Rouj 2b	2-1			7		11-9		Arzy-Test Pit A, layer 10 7990±375b p.(N-5975) Arzy-Test Pit A, layer 11 8550±470b p.(N-5974)*
	4-3		2-1	8				
Rouj 2a	6-5		?	?				Kerkh-Test Pit A, layer 5 8680±355b p.(N-6545)*

Table 7.1 The Late Neolithic chronology in the Rouj basin.

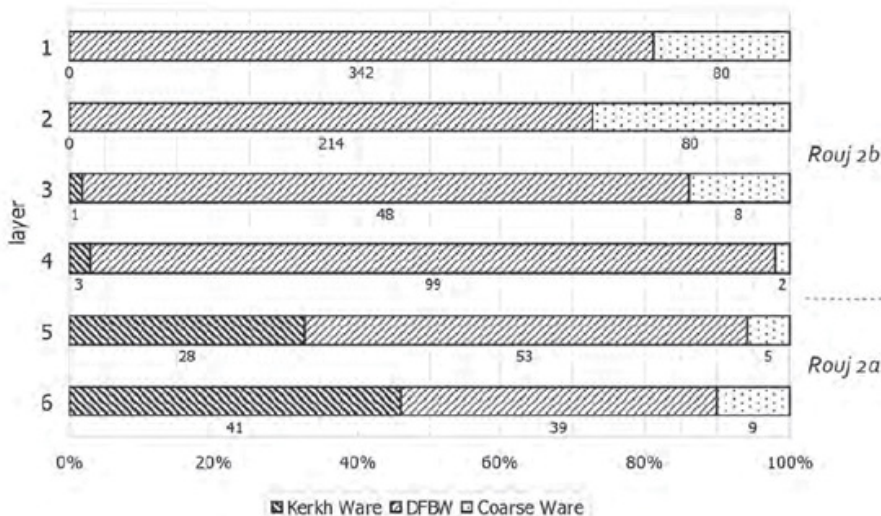


Table 7.2 Pottery assemblages of each layer at Test Pit A of Tell el-Kerkh 2, based on number of potsherds (after Miyake 2003: Table 32).

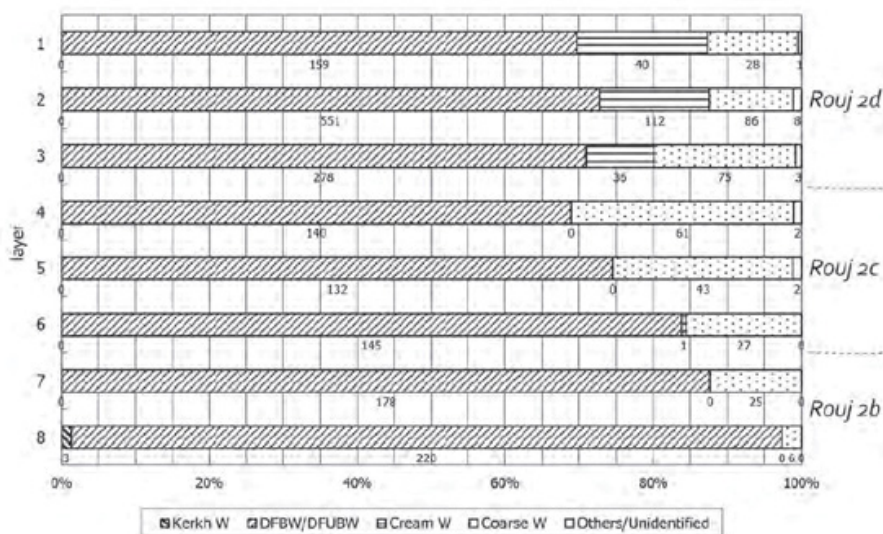


Table 7.3 Pottery assemblages of each layer at East trench of Tell Ain el-Kerkh, based on number of rim sherds.

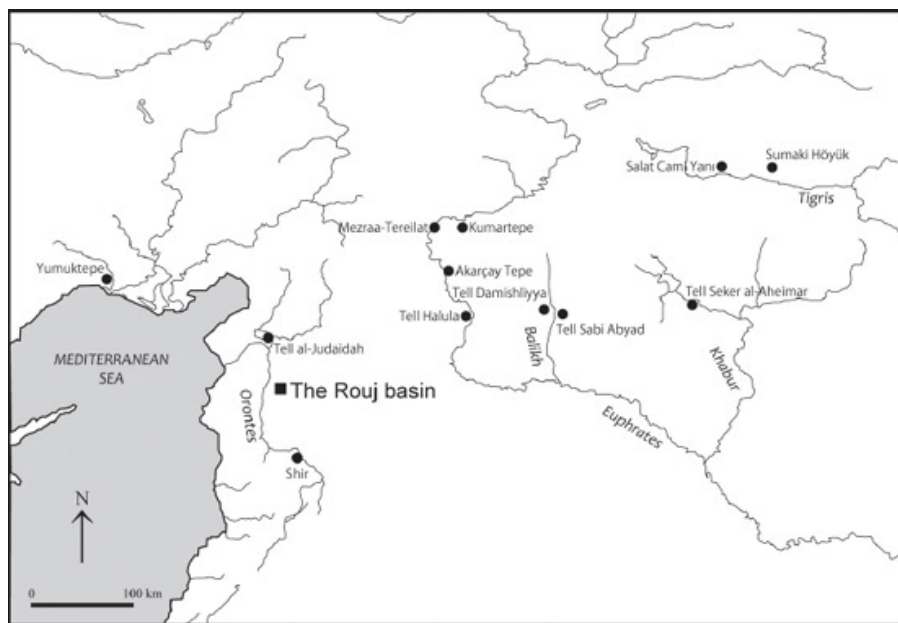


Fig.7.4 Locations of excavated sites yielding the oldest pottery.

Rouj 2a layers have been exposed only in Test Pit A of Tell el-Kerkh 2, the first operation to yield Kerkh Ware in 1992 (Iwasaki and Tsuneki 2003). The pottery assemblage in this period consists of three ware-types: Kerkh Ware, Dark-faced Burnished Ware (DFBW) and Coarse Ware (Fig. 7.3: 1–15). Based on the number of potsherds, both Kerkh Ware and DFBW are equally dominant in the assemblage, while Coarse Ware is quite rare (Table 7.2). As for technical attributes, mineral inclusions and burnished dark surfaces are commonly found in Kerkh Ware and DFBW. However, Kerkh Ware can be distinguished from DFBW by a lack of decoration, probably intentionally heavier mineral tempering, thicker walls, usually exceeding 10 mm, and a simple vessel shape of a bowl with a diameter of around 20 cm. These attributes seem to be simpler than those of DFBW, and the stratigraphic context additionally implies that Kerkh Ware is an older variety than DFBW. DFBW is well known as a typical ware-type throughout Late Neolithic northern Levant and Cilicia. In the Rouj 2a period, nail impressions or pinched decorations are usually applied on the whole outer surface of DFBW sherds (Fig. 7.3: 10–14). Coarse Ware shows some contrasting attributes to Kerkh Ware and DFBW, such as a light-coloured surface usually treated with rough smoothing and heavy plant temper. As for vessel shapes in this period, only simple bowls can be observed for Kerkh Ware and DFBW. Most of

the Coarse Ware has such thick walls that an original large vessel shape could be presumed, although the examples are too fragmented to reconstruct the whole shape. It seems surprising that multiple ware-types appeared from the beginning of pottery production. Moreover, Kerkh Ware and DFBW apparently form the category of 'Fine Ware' which is contrasted to Coarse Ware.

Cultural accumulations of the succeeding Rouj 2b period have been mainly identified in three excavated areas of Tell el-Kerkh, as well as in the Step Trench of Tell Aray 2, a mound of another 'mega-site' in the Rouj basin (Iwasaki et al. 1995). Vessel shapes diversified in this period; for example, the necked jar appeared (Fig. 7.3: 20–22). *Moyen de préhension* (Le Mièrre and Picon 1998: 13) such as ear-shaped lugs (Fig. 7.3: 23) and applied horizontal bands (Fig. 7.3: 24) are frequently applied on both DFBW and Coarse Ware. Among the Coarse Ware, there are pieces with incised decorations (Fig. 7.3: 25) or plaster coating (Fig. 7.3: 26). Within the pottery assemblage, the sharp decline of Kerkh Ware is remarkable. For example, from the East Trench of Tell Ain el-Kerkh, it consists of only a very low percentage of the whole pottery assemblage, on the basis of number of rim sherds (Table 7.3). Moreover, Kerkh Ware entirely disappeared in the later phase of this period which is known from the uppermost layers in Test Pit A of Tell el-Kerkh 2 and at Tell Aray 2. Instead, DFBW overwhelmingly dominates the pottery assemblage, comprising over 80% of the all the potsherds. But this ratio also gradually decreased through this period, while Coarse Ware increased and became more popular (Tables 7.2–3). The results of the excavations in the East Trench of Tell Ain el-Kerkh suggest that the tendency for DFBW to decline had continued until the middle of the Rouj 2c period and after that its ratio levelled off at around 70% until the end of the Late Neolithic, namely the Rouj 2d period, c.6100–5800 cal. BC (Table. 7.3). This can be interpreted to mean that the concept of DFBW as 'Fine Ware' and its distinction from 'Coarse Ware' was completely fixed in the middle of the Rouj 2c period. The Rouj 2b period, in this case, would lie in the formation process of this concept. Thus, it is possible that an unknown pottery assemblage consisting of only DFBW or Kerkh Ware can be expected, which would represent the oldest Pottery Neolithic in the northern Levant.

Regional relationships of the early pottery

Interesting results have been provided by recent research at Yumuktepe in Cilicia concerning the oldest pottery assemblage consisting of DFBW. It is said that only 'Sandy Ware', a ceramic ware-

type which resembles Kerkh Ware, was exclusively recovered without any other ware-type from the basal layer on virgin soil (Balossi 2004; Balossi Restelli 2006). The Late Neolithic culture in Cilicia has been traditionally known as a part of the so-called Syro-Cilician assemblage, a regional cultural framework which was proposed by Robert J. Braidwood in 1950s (Braidwood 1954, 1955), as well as that in the northern Levant. DFBW is one of the major components in the Syro-Cilician assemblage, and the Late Neolithic layers at Yumuktepe have certainly yielded large amounts of DFBW as well. Therefore, basal Yumuktepe seemingly represents the oldest Pottery Neolithic in the Syro-Cilician assemblage, which preceded Rouj 2a period. However, the concept of the Syro-Cilician assemblage must be reconsidered, at least as for pottery. In the levels that follow basal Yumuktepe, DFBW indeed takes over the dominant position in the assemblage, just as in the case of the Rouj basin. However, DFBW declined sharply to become a minor component in the later phase of the Late Neolithic, at the end of the 7th millennium cal. BC (Balossi 2004; Balossi Restelli 2006). Additionally, for the old excavations at another Late Neolithic site, Gözlü Kule in Cilicia, it was reported that DFBW was “less numerous” (Mellink 1956: 65). In contrast to the northern Levant, DFBW cannot be presented as the enduring Fine Ware in Cilicia, because of its decline. Moreover, plant-tempered pottery such as Coarse Ware is also very limited in the Late Neolithic period, according to the results from Yumuktepe. Therefore, the ‘Fine Ware’ versus ‘Coarse Ware’ distinction seems uncertain in this region. The dominant ware-type in the later phase of the Late Neolithic at Yumuktepe is a light-coloured mineral-tempered pottery, “Pinkish Gritty Ware” (Balossi Restelli 2006: 18). These facts suggest a clear difference between Cilicia and the northern Levant, although it is said that both regions belong to the Syro-Cilician assemblage. Each region apparently has a unique approach to the concept of pottery manufacture. Thus, it is unclear whether the basal Yumuktepe assemblage can be regarded as the oldest Pottery Neolithic commonly found throughout the Syro-Cilician region or not.

In any case, Kerkh Ware is similar to the other oldest pottery in neighbouring sites, such as Sandy Ware in Yumuktepe. According to Balossi’s argument (Balossi 2004; Balossi Restelli 2006), Kerkh Ware is comparable to DFBW with “calcite in red clay” discovered in floors 28–26 of Tell al-Judaidah in the Amuq plain (Matson’s notes in Braidwood and Braidwood 1960: 49–50). In addition, similar pottery was found not only within the northern Levant and Cilicia but also throughout northern Syria and southeastern Anatolia (Fig. 7.4).

Recent intensive investigations in these regions has revealed many examples of 'the oldest' pottery at several sites: Shir in the Hama district, Tell Halula, Akarçay Tepe and Mezraa-Teleilat on the middle Euphrates, Tell Sabi Abyad on the Balikh, Salat Cami Yanı and Sumaki Höyük on the upper Tigris, Tell Seker al-Aheimar on the Khabur, and so on (Bartl and Haidar 2008; Faura and Le Mièrè 1999; Arimura et al. 2000, 2001; Balkan-Atlı et al. 2002, 2004; Karul et al. 2002; Akkermans et al. 2006; Nieuwenhuyse 2006; Miyake et al. 2009; Nishiaki and Le Mièrè 2005, 2008; see also the other contributions in this volume). Although they are geographically distributed over a vast area, several common attributes can be observed among most of them. Heavy mineral temper is a notable aspect although the types of mineral varied, probably because of each local geological environment. Burnishing treatment on surfaces is also commonly seen. In addition, the vessels mostly have relatively thick walls and simple shapes consisting only of bowls with diameters measuring around 20 cm. Decoration is quite rare except for specimens from Tell Sabi Abyad, which are often painted (Nieuwenhuyse 2006). As mentioned above, Kerkh Ware has all these attributes, as does the oldest pottery in northern Levant and Cilicia, such as DFBW with calcite in red clay and Sandy Ware. This fact suggests simultaneity and homogeneity of the emergence of pottery in a vast area, although it was not long before regional diversity appeared (Odaka 2005; Le Mièrè 2007).



Fig.7.5 Storage clay bins in Str. 655, Tell Ain el-Kerkh.

A tentative view on the emergence of pottery in West Asia

An article by Rice (1999) discussed the origins of pottery, referring to three major components in pottery technology. The first is the use of clay and the second is the use of fire. Much evidence demonstrates that Neolithic people in West Asia had very good knowledge of both during thousands of years of sedentary life before the beginning of pottery production. Thus, the third component is the more important

factor in the emergence of pottery in the case of West Asia. It is the “recognition that clay + fire can be manipulated in such a way as to meet a need for containers” (Rice 1999: 4). As for containers, it is well known that organic materials such as animal skin, reed and wood have been used to make them. Most containers made of organic materials, however, have been naturally lost so that the evidence of them remains obscure. On the other hand, inorganic materials became important for making containers after the transition to sedentary life, probably because of their heavy weights (cf. Schmandt-Besserat 1974, 1977a, 1977b). Stone vessels first appeared in the Epi-Palaeolithic period and later gypsum or lime plaster was adopted for making containers at the end of Neolithization. The oldest example of a container made of gypsum or lime plaster, so-called White Ware, was recovered from the MPPNB layer at Ain Ghazal (Kafafi 1986) and generally unearthed at succeeding LPPNB sites. However, most of the examples of White Ware in West Asia are actually dated to the Late Neolithic period rather than PPNB (Kume 2007: 116–118). Simultaneously, containers made of clay appeared in the PPN period, such as irregular-shaped vessels (e.g. Cauvin 1974; Özdoğan and Özdoğan 1993) and bins attached to buildings (e.g. Smith 1990: 332, Fig. 1; Bader 1993: 13; Nissen et al. 1987: 109; Rollefson et al. 1992: Figs. 4, 13). However, they generally seem to be unbaked, not hardened by intentional firing. The emergence of pottery which is made of baked clay was apparently parallel with the flourishing of White Ware. Both new kinds of container, White Ware and pottery, possibly developed in a similar manner within a similar socio-economic context together with the completion of the Neolithization process (cf. Dornemann 1986: 58–59; Akkermans et al. 2006: 139). The demand for containers increased at that time, although the reason for that is still obscure.

What is the catalyst fueling the demand for containers? Some studies have already examined the possibility of food processing as a function of early pottery (Molleson and Jones 1991; Molleson et al. 1993; Le Mièrre and Picon 1994, 1998, 2003; see also Miyake 2009). Heavy mineral temper, which is commonly observed among the oldest pottery, seems suitable for cooking in terms of heat resistance. White Ware made of lime or gypsum plaster is not suitable for cooking, although it developed in parallel with pottery in the same situation. Especially in upper Mesopotamia, plant-tempered pottery, which seems unsuitable for cooking, becomes dominant in succession to the oldest pottery. Thus, it is evidently hard to assume that pottery was originally invented for cooking or that only food processing was a

major cause increasing the demand for containers.

Storage cannot be regarded as a main purpose for the oldest pottery in northern Syria and southeastern Anatolia, although it is certainly a general function of later pottery. It is reminiscent of traditions of other kinds of storage facilities, including fixed ones, from the beginning of sedentary life. The 2008 season's work at Tell Ain el-Kerkh provided a new source to consider relations between previous storage facilities and the oldest pottery. Str. 655, a burnt building, was discovered in layer 8 of the East Trench, which belongs to the Late PPNB period, directly preceding the PN in layers 1–7. Within an exposed rectangular plan measuring about 5.5 x 2 m, there are at least fourteen clay bins (Fig. 7.5). They could be storage facilities, although we found very few contents within them; it seems that they had been intentionally emptied out before abandonment. Most of the bins are barrel-shaped, measuring about 45 to 65 cm in diameter. The light brown fabric is very coarse and too fragile to pick up without any fragmentation. The wall thickness is about 2 or 3 cm, and its surface is plastered with buff-coloured mud just as the pisé wall of the building. These traits of the clay bins in Str. 655 demonstrate that the oldest pottery and Kerkh Ware did not have a direct connection with preceding clay bins. They have neither common attributes nor a trace of a lineage between them. This fact implies that the oldest pottery was not mostly used for storage.

Portability of pottery is one of the most significant differences from the fixed clay bin. In addition, *moyen de préhension*, which is frequently seen among early pottery, would be preferable for handling. Thus, transport can be assumed to be an important function of the oldest pottery. On the other hand, their small size and simple vessel shape seem suitable to serve foods or other commodities. Of course, other kinds of use can be suggested, such as ritual, ceremonial and prestige goods. However, it is hard to prove absolutely such kinds of functions for the oldest pottery. Rather, it must be a natural interpretation that the simple-shaped oldest pottery was used for various purposes and was an unspecialized vessel. Therefore, it should be properly called simply a multi-functional 'portable container'.

Concluding remarks and perspectives

As indicated, Kerkh Ware is not only the oldest variety among DFBW in northern Levant, but also one of the oldest type of pottery widely distributed throughout northern Syria and southeastern Anatolia. It was developed simultaneously and had several common attributes. However, there is still room for better understanding. The analysis

above suggests that the (as yet unknown) oldest pottery assemblage, possibly consisting only of Kerkh Ware, should be expected to be discovered in the northern Levant.

The emergence of pottery seems to be driven by the increasing demand for containers at the end of the process of Neolithization, although the definite or specific cause is still obscure. Judging by the present evidence, the oldest pottery including Kerkh Ware should, perhaps, be regarded as 'portable containers,' rather than as primarily cooking or storage vessels, at least in northern Syria and southeastern Anatolia.

Homogeneity and multi-functionality crucially characterize the first stage of pottery manufacture in northern Syria and southeastern Anatolia. Pottery made of baked clay at that time seems to be regarded as just another kind of container along with others made of various materials, such as White Ware, stone vessels, basketry and so on. The invention of specialized pottery for a specific purpose had to be achieved at the next stage of pottery manufacture which was characterized by diversification and spread (cf. Le Mière and Picon 1998: 15). Diversification in every respect such as fabric, vessel shape and treatment facilitated the introduction of specialized vessels, for example cooking pots and storage jars. Moreover, they proved wide usability of pottery which promoted widespread continuous pottery manufacture. At this stage, clay was evidently a dominant material for containers. As for containers made of the other materials, White Ware sharply declined (cf. Balfet et al. 1969) and most stone vessels became prestige goods without practical functions in daily life, for example as funeral gifts recovered in Samarran burials (e.g. el-Wailley and es-Soof 1965). This view might be still hypothetical at the present, but further investigations will demonstrate a more detailed process from the emergence to the spread of pottery manufacture in the Late Neolithic.

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Chapter 8

The Early Pottery from Shir, Northern Levant

Olivier P. Nieuwenhuys

Introduction

Although for the northern Levant a number of important Neolithic key sites have been excavated and published in detail, our understanding of the earliest introduction of pottery remains poor. Pottery came into use in this region probably as early as in many other parts of Western Asia, or perhaps even earlier. But until the excavations at Kerkh and at Tell Nebi Mend began to provide a sound culture-historical framework for the Rouj Valley (Iwasaki et al. 1995; Tsuneki et al. 1997, 1998, 1999, 2000; Tsuneki and Miyake 1996; Odaka 2003) our understanding of when and how this happened relied upon a mere handful of sites, often excavated and published not entirely according to current-day preferences.

In the region, of course, the pioneering excavations in the Amuq (Braidwood and Braidwood 1960) are still a major source of inspiration, but the Amuq sequence has been shown to be incomplete. In the northern Levant, quite a number of Pottery Neolithic sites have been reported from surveys (e.g. Copeland 1969; Copeland 1999; de Contenson 2000; Haidar-Boustani et al. 2007; Kirkbride 1969; Müller-Neuhof 1998; Bartl and Chayaa 2002) but they were not further investigated. Others have been sounded only summarily, or the archaeologists reached the Pottery Neolithic at the narrow base of deep soundings, for instance at Tell Sukas (Riis and Thrane 1974), Tabbat al-Hammam (Hole 1959), Ras Shamra (de Contenson 1992) or, closest to Shir, the mighty citadel of Hama (Thuesen 1988). The key site of Byblos is often cited as a candidate for the earliest ceramics in the region (Dunand 1973). However, the earliest ceramics from this site – somewhat confusingly termed *néolithique ancienne* – compare well with the southern Levantine Yarmuk culture, and hence belong to a later era.

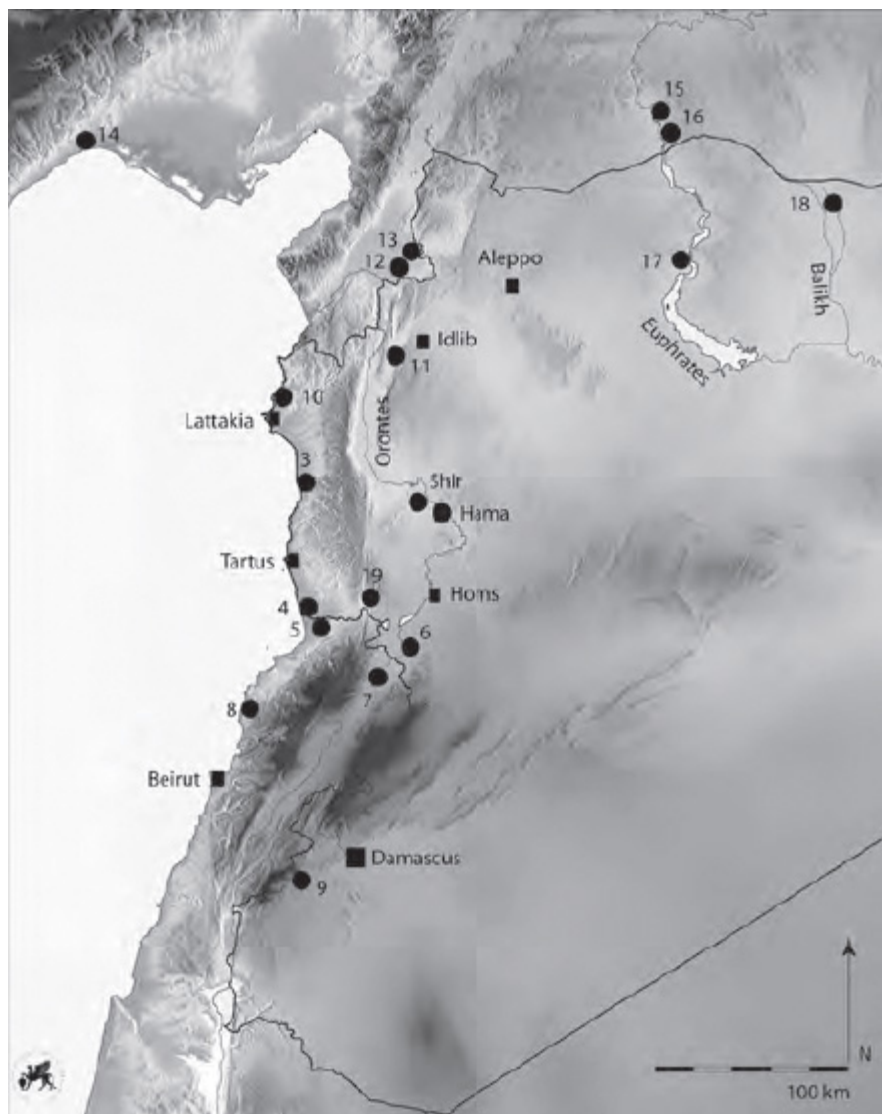


Fig.8.1 The northern Levant and its neighbours, showing the locations of Late Neolithic key sites mentioned in the text. 1.1: Shir. 2: Hama. 3: Tell Sukas. 4: Tabbat al-Hammam. 5: Tell Hmaira. 6: Tell Nebi Mend. 7: Labweh. 8: Byblos. 9: Ramad. 10: Ras Shamra. 11: Tell el-Kerkh. 12: Tell Dhahab. 13: Tell Judaidah. 14: Mersin-Yumuktepe. 15: Mezraa Teleilat. 16: Akarçay Höyük. 17: Tell Halula. 18: Tell Sabi Abyad. 19: Tell al-Marj.

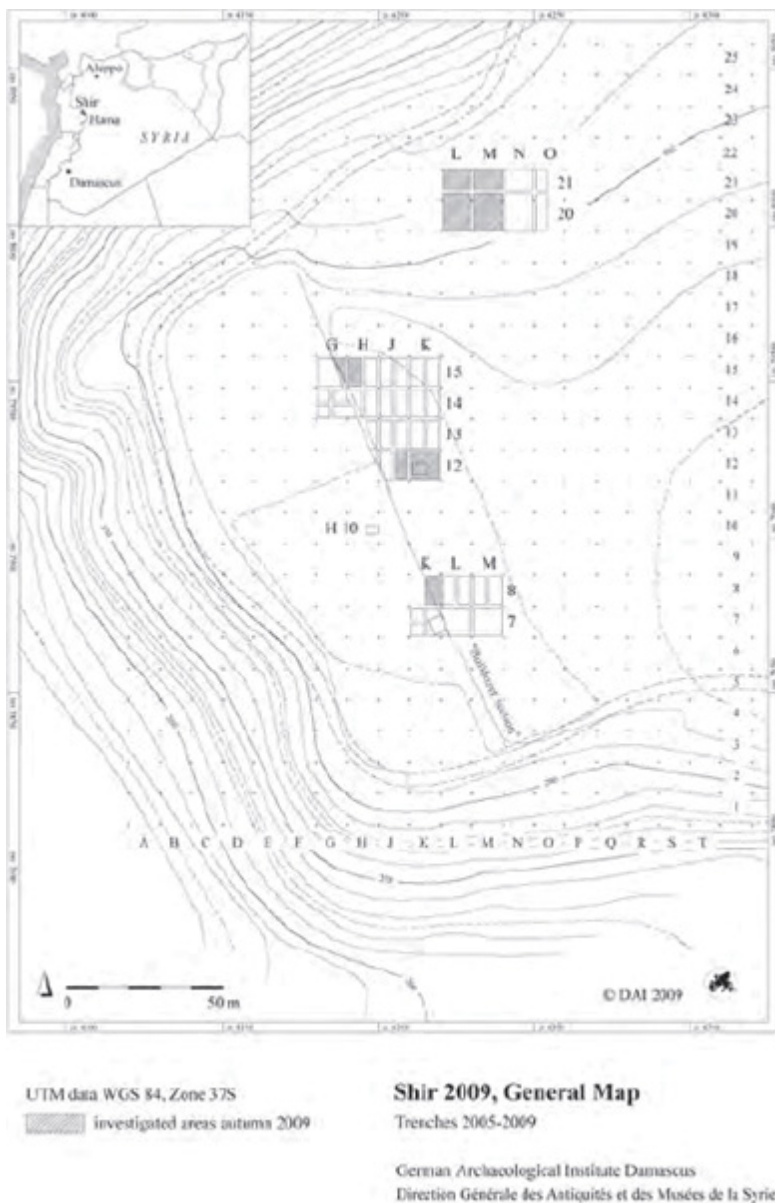


Fig.8.2 Map of Late Neolithic Shir, showing the recent bulldozer cut across the site. The South Area comprises trenches K7 to M8.

It is therefore fortunate that several projects in the northern Levant have recently begun to investigate the Pottery Neolithic with renewed gusto. In addition to the work at Tell Kerkh, key sites include Tell Nebi Mend (Copeland 1999; Mathias 2015), Tell al-Marj (Haidar-Boustani et al. 2007), and Shir (Bartl and Haidar 2008; Bartl and Nieuwenhuyse 2008; Bartl et al. 2006a, 2006b; Nieuwenhuyse 2009) (Fig. 8.1). The inland cities of Homs and Hama are the two main foci

of modern urban life in the region, as are the bustling Mediterranean ports of Tartus and Latakia. The Orontes River, running due north from the Beqaa towards the Amuq, has always been a major source of water as well as a major route for transportation.

Levels 4–6	6500 – 6400 B.C.
Intermediate	6700 – 6500 B.C.
Levels 1–3	7000 – 6700 B.C.
Initial occupation of the site	7050 B.C.

Table 8.1. Absolute dates for the archaeological sequence at Shir.

The Late Neolithic site of Shir

Shir lies on the Sarut, a small, perennial tributary of the Orontes. The site should not be confused with the adjacent mound of Tell Shir, situated in the river valley and dated to the Bronze Age. The Neolithic site is located high up on a spur overlooking the valley (for a full description of the site and its setting, see Bartl and Haidar 2008). The site, which measures about 4 ha, is relatively flat and inconspicuous on the surface. It was only discovered after agricultural levelling activities unexpectedly produced a scatter of prehistoric material and led to the removal of perhaps one third of the archaeological deposits. This unfortunate destruction left a step-like bulldozer cut running across the site (Fig. 8.2). Work began with a small sounding in 2005 and has continued since. In what has been termed the South Area of the site, a sounding from the modern surface down into virgin soil resulted in the identification of at least six major building levels, termed level 1 to level 6, with level 1 situated immediately above bed rock (Table 8.1). A series of radiocarbon dates has fixed the beginning of human occupation at shortly after 7050 cal. BC. Levels 1–3 are dated between 7000 and 6700 cal. BC. Levels 4–6 date between 6500 and 6400 cal. BC. An apparent hiatus of some two centuries separates the sequence.¹



Fig.8.3 The trenches in the South Area seen from the west. Trench KL7 is at the foot of the bulldozer cut.

Here we shall concern ourselves only with the lower three occupation levels (levels 1–3), radiocarbon-dated to 7000–6700 cal. BC (see Campbell, this volume, for a discussion of absolute dates). These levels have thus far been reached in just one sounding: trench KL7 in the South Area, at the foot of the artificial bulldozer cut (Fig. 8.3). Architectural remains were certainly found, but the highly fragmented state of the material suggests that the bulk of the material derives from secondary or tertiary deposits. The cultural context is rich in archaeological materials including lithics and an abundant production of white ware and stone vessels. So far no unfired clay vessels have been found; quite possibly the eroded context significantly reduces the likelihood of finding them at all.

Pottery occurs already in the very earliest strata documented at the site (i.e. level 1). Although sherd densities still have to be computed, we get the impression that in these earliest levels the quantities of pottery are not as abundant as in later levels. If so, this would suggest that in this early stage relatively limited numbers of pottery vessels were in daily use. This impression needs to be followed up as soon as the stratigraphic analysis becomes available. Because this is not yet the case, I shall discuss the ceramics from levels 1–3 as a unit. It is important to note that pottery occurs in an already fully-developed form in these strata: no trial-and-error pieces have been found so far, nor do the excavations at Shir suggest a stage of experimenting with new technologies and raw materials prior to the establishment of ‘real’

pottery. Strictly speaking, the early pottery from trench KL7 may not represent the earliest in the region. The cultural sequence documented so far at Shir does not include continuity from the aceramic period into the Pottery Neolithic; as far as we are aware there are no final Pre-Pottery Neolithic levels at the site.

The earliest ceramics at Shir

The ceramic assemblage of levels 1–3 in trench KL7 comprises three distinct wares (Fig. 8.4). The main group, which comprises around 73% of the bulk, has been termed Dark-Faced Burnished Ware (DFBW), in accordance with comparable finds at other Levantine sites. Two varieties of DFBW have been distinguished on the basis of the firing, viz. oxidized and purposely-reduced. The latter constitutes about half of the assemblage. In addition, a very light-coloured, calcareous group of ceramics termed Light-Faced Burnished Ware (LFBW) comprises about 15%. LFBW is typical for these early levels, and disappears entirely in later levels at the site. In addition, a coarsely-shaped, thick-walled, roughly-finished category has been termed Coarse Unburnished Ware (CUW). In the earliest levels this category forms some 12%. It is possible that CUW sherds come mostly from the upper levels in trench KL7 (i.e. level 3), but this impression requires further study of the stratigraphy.

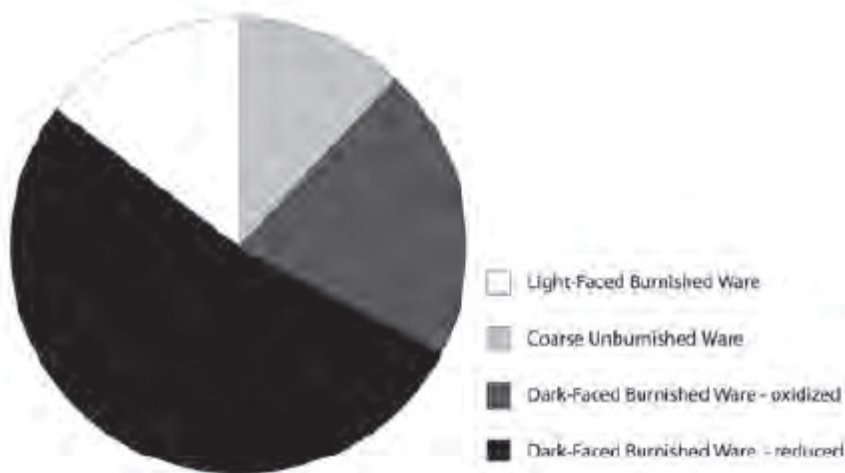


Fig.8.4 Shir; the composition of the ceramic assemblage in trench KL7, levels 1.

In adopting the term DFBW, we were, of course, aware of certain difficulties associated with this very general Levantine term. In the Levant, as Miyake (2003) reminds us, there has been an unhelpful

tendency to extend this terminology to anything made of pottery that is somewhat glossy and mottled in surface appearance. New work now shows that there was, in fact, significant variation within what is called DFBW, not just in vessel shape and decoration but in basic aspects of the chaîne opératoire as well (Balossi 2004; Balossi 2006; Diebold 2000; Diebold 2004; Diebold in prep; LeMiere and Picon 1999; Tsuneki and Miyake 1996; Miyake 2003). Further scrutiny of Late Neolithic DFBW technologies in the Levant will most certainly prove to be highly rewarding.

At Shir, what is termed DFBW is characterized by a fabric showing a large amount of small mineral inclusions and a complete absence of plant inclusions. A limited sample of DFBW sherds has been investigated at the Freie Universität Berlin. This preliminary work shows that the non-plastic inclusions are somewhat heterogeneous in nature, but mostly they are calcite in various quantities. Interestingly, a single example of basalt-tempered DFBW was attested as well, perhaps pointing to a relationship with the basalt-tempered ceramics from the slightly later site of al-Marj to the south (Ibáñez pers. comm. December 2009).

Re-firing tests show that the ceramics were fired at low temperatures, below 750°C. It seems to be clear that much of the DFBW in these early levels was deliberately made to be dark, by means of a purposely-reduced firing. Reduced DFBW shows an even, homogeneous, dark surface colour, often including the core, ranging from dark-grey to black (5YR 2.5/1–3/1). In contrast, oxidized DFBW has surface colours varying from brown to reddishbrown or greyish-brown (10YR 6/3–4/3), less often buff or red. The oxidized firing has frequently left dark, incompletely oxidized cores. In levels 1–3, the greater majority of the DFBW belonged to the reduced variety. Alternating colours observed in the cross-sections of many reduced sherds – the ‘sandwich’ effect – suggests that the dark effect was created by a deliberate smudging at the end of the firing process (‘end reduction’). Apart from the dark colour, the thorough surface finishing is characteristic for DFBW across the Levant. Dark-Faced Burnished Ware vessels were made to be very regular. At Shir, most of the DFBW was burnished, usually on both surfaces. If not burnished, the vessels were at least carefully smoothed.

DFBW morphological variation is minimal. Only two main DFBW shapes have been found: bowls and small jars or goblets with low necks. The bowls mostly have convex walls without a carination, and range from open to closed. Vessels are small in size, and mostly thin-walled (average thickness 7 mm). Rims are simple, but pointed, flat or

bevelled rims are fairly common, whereas many vessels show the typical DFBW 'splayed rim', i.e. flattened rims that thicken significantly near the rim. Splayed rims may be associated largely with just one vessel shape, the closed, convex-sided bowl. Appendages of various kinds are frequent. Characteristic are 'ear-shaped' lugs. Bases are flat. Over 99% of all counted sherds were plain; the rare decoration consists of a few sherds with impressed or incised decoration.

The category we have provisionally termed Light-Faced Burnished Ware is not entirely dissimilar to the DFBW in the earliest levels at Shir. It shares with DFBW an absence of plant inclusions, a carefully finished surface, and a very regular wall profile without angularities or irregularities. As with the DFBW, most LFBW sherds were burnished. LFBW was entirely undecorated. Similarly to DFBW, LFBW shows simple shapes, without carinated shapes or vessels with distinct necks. And similarly to DFBW, vessels were mostly small. Appendages were rare with LFBW, but we came across a few 'ear-shaped' lugs. The vessels all seem to have had flat bases.

The main reason for distinguishing the LFBW as a separate category in the field was the characteristic light colour of both surface and core, which moves in the range of cream-buff to light grey (7.5YR 8/1, 10YR 7/1–8/1). In terms of raw materials and ceramic technology this category appears to differ strongly from DFBW. The preliminary work at the Freie Universität Berlin included one sample of LFBW. This piece was characterized by a fine marl containing virtually no non-plastic inclusions besides isolated pieces of calcium carbonate and basalt. We are not aware so far of any good comparisons, but similar-looking ceramics have been reported from Ras Shamra, period VA (de Contenson 1992) and from Tell Sukas, periods N-1 to N-3 (Riis and Thrane 1974). Although these superficial comparisons are certainly in need of closer scrutiny, they do suggest that this category was not some bizarre experiment embarked upon only by Late Neolithic communities from the Orontes, but that it had a wider regional appeal.

Some concluding remarks

The investigations at Late Neolithic Shir provide a fascinating window on early ceramic production and consumption in the Hama region. The earliest settlers at this site (level 1) were already making and using ceramics. Shir therefore does not tell us with certainty when and how pottery emerged. It is possible that earlier ceramic complexes existed in the area, and are still to be discovered. These may include

the 'experimental' stage which, as Marie Le Mièrre argues, should precede the production of real pottery (see Le Mièrre, this volume). At Shir no 'Kerkh Ware' has thus far been attested, a common element of the The Early Pottery from Shir, Northern Levant earliest stages of the Pottery Neolithic only slightly further to the north in the Rouj Basin and at Yumuktepe-Mersin (see Odaka and Balossi, this volume). Possibly an Orontes-Valley 'Kerkh-Ware stage', too, awaits discovery by eager prehistorians.

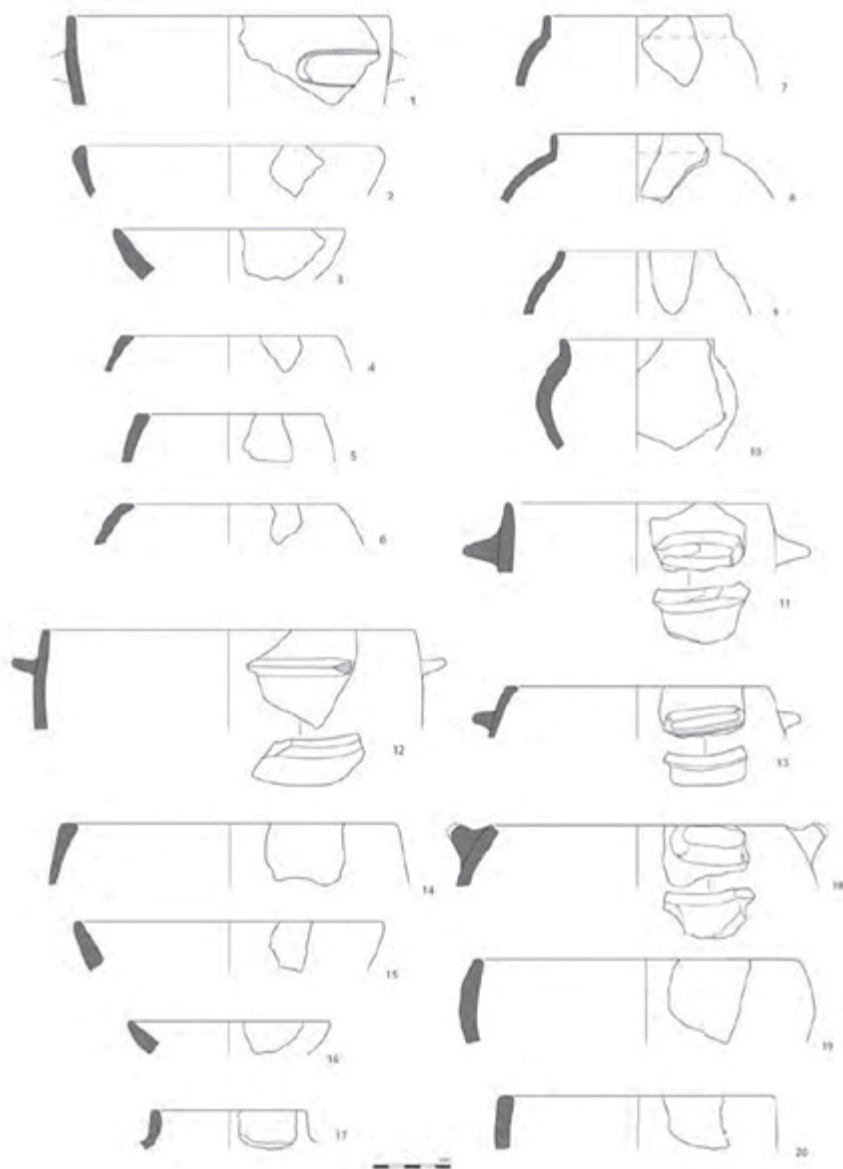


Fig.8.5 Shir: ceramics from trench KL7. Nos. 1–13: DFBW. Nos. 14–20: LFBW.



Fig.8.6 Shir: ceramics from trench KL7. DFBW, reduced variety.

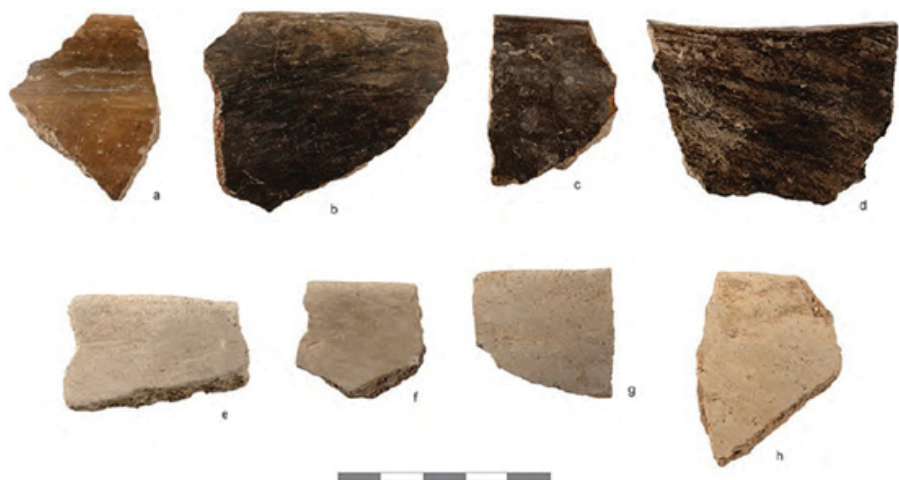


Fig.8.7. Shir, ceramics from trench KL7. Upper: DFBW, oxidized variety (far left) and reduced variety; Lower: LFBW (photo: DAI/Irmgard Wagner).

Shir		Typological comparisons					
Cal. BC	Trench Level	Central Levant			Northern Levant		
		Hama Citadel	Tell Sukas	Tabbat al-Hammam	Ras Shamra	Amuq Valley	Rouj Valley
6100		Period L			IV	Amuq C	Rouj 2d
	K12 - N/O20				VA-II	Amuq B	Rouj 2c
6400	level VI						
	L7				VA-I		
	level V		N-1				
			N-2 Late	TT-I-1			
	level IV		N-3			Amuq A	Rouj 2b
6500			N-4				
			N-5				
6700	level III		N-6 Middle		VB		
	KL7	Period M	N-7				
	level II		N-8				
			N-9				
			N-10 Early				
			N-11				
7000	level I						Rouj 2a
					VI		Rouj 1

Fig.8.8 Some tentative comparisons for the ceramic sequence at Shir.

Alternatively, it also seems possible that an earlier stage of this kind never existed in this region. If pottery emerged slightly earlier in the northern parts of the Levant, this innovation may have been adopted wholesale by communities somewhat further south. Neolithic groups in the Orontes region may have skipped the troublesome experimental and Kerkh-stages, embracing the latest addition to their already flourishing range of container technologies only at the point when it had already established itself socio-economically further north. Quite possibly, the adoption of pottery in the region resembled the situation in the Jezira, where ceramics appear to have arrived fully fledged as well. Close examination of carefully collected radiocarbon dates and detailed comparisons between the ceramic assemblages from the various sites in the Levant will hopefully shed more light on this issue. A first, admittedly tentative, attempt at a regional chronology is shown in [Fig. 8.8](#).

However this may be, the absolute dates available for Shir suggest that pottery arrived in the Orontes Valley at, or shortly after, 7000 cal. BC. This is surprisingly early and it matches the dates for the adoption of pottery to the north and to the northeast. In this case, the upper

reaches of the Orontes valley took part in the early spread of pottery production at the start of the 7th millennium cal. BC, a first 'wave of advance', if the metaphor may be used, of early ceramics across Western Asia. It also seems clear that, in spite of localized solutions and regional peculiarities, the earliest ceramic traditions in this region by and large fit well within the framework reconstructed for the Rouj basin and further north. Shir was certainly not the southernmost extension of this early ceramic horizon. What evidence there is suggests that the initial 'wave' rolled somewhat further southwards into the northern parts of Lebanon, but there it appears to have stopped. In the southern Levant, people seem to have continued their aceramic ways of life until the emergence of the Yarmuk tradition, several centuries later.

Why were northern Levantine Neolithic communities interested in adopting pottery? What factors increased their level of receptivity? This question obviously cannot be answered by looking at the ceramics in isolation. Attempts at explanation should include the broader range of 'soft-ware' technologies available, which provided good alternatives to pottery. In particular, the social organization of the Neolithic groups that initiated production should be taken into account. For the northern Levant, this task has hardly begun, but it is now becoming possible. As to the properties of the earliest pottery containers themselves, we may note the limited size and volume of the average vessel, and the absence of necks. For their long-term, bulk-storage activities, Neolithic groups apparently continued practices successfully established much earlier. Understandably, they preferred not to use a novelty such as pottery for this.

Given the technological performance-characteristics of the early DFBW – calcite temper, even wall thickness, burnished surfaces – it seems very likely that cooking was one of the functions of these early ceramic containers (see Le Mièvre and Odaka, this volume). The early DFBW perhaps constituted a special category of small-sized containers that was added to the existing range of small-sized containers made in other materials. The use of these vessels may initially have been restricted to special occasions. Significantly, if both DFBW and LFBW were technically speaking undecorated, they were certainly not coarse. The earliest pottery in the Northern Levant as we currently know it was carefully shaped and finished, and the potters took care to create a range of products in different shades of colour and darkness.

At Shir, as elsewhere in Western Asia, the real breakthrough of pottery in massive numbers appears to have occurred only at a later

stage. At Shir it took place during levels 4–6, dated between 6500–6400 cal. BC. The process was associated with dramatic technological, morphological and stylistic innovations. Pottery turned into a largely plain ‘coarse ware’ (Coarse Unburnished Ware in Shir terminology). The assemblage at this point shows a heavy, and new, emphasis on functional, utilitarian roles that included storage, preparing food and drink, as well as various industrial activities. A new era had begun.

1. The sequence of six building levels refers only to the southern-central part of the site. Other excavated areas at the site yield a different sequence. None of these suggests occupation older than the basal levels of trench KL7. The site as a whole seems to have been deserted around 6100 cal. BC.

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Chapter 9

Yumuktepe Early Ceramic Production: Dark versus Light Coloured Wares and the Construction of Social Identity

Francesca Balossi Restelli

Introduction

The ancient site of Yumuktepe lies at the western end of the Adana coastal plain in modern Turkey. The first excavations of the site started in 1936 under the direction of John Garstang of the University of Liverpool and carried on until World War II (Garstang 1953) and for a couple of years after it.

Excavations at Yumuktepe were then resumed in 1993 by a Turkish-Italian team directed first by Prof. Sevin and then by Prof. Caneva (Caneva and Sevin 2004). The correspondence between Garstang's stratigraphy and that of the new excavations has not been easy to understand because most of the plans of the previous excavations were lost during World War II and is thus in some cases still tentative, provoking at times contrasting interpretations.

The site, 4.8 ha in area and 25 m high, is on alluvial fertile soils at the base of the Taurus range, along the route from Anatolia to Syria, through the Beylan pass, the Amuq and directly into the Rouj Basin.

Stratigraphy and chronology

No aceramic levels of occupation have been discovered at Yumuktepe, thus making it difficult to assess whether the earliest occupation actually corresponds to the first moments of pottery production or whether it is later. The deposits corresponding to the Pottery Neolithic are 11m deep in the north west side of the mound, thus testifying to a very long and probably continuous occupation. There are seven radiocarbon dates from the earliest levels of occupation and another five from the immediately following levels, corresponding to Rouj 2c. Here I use the Rouj chronology, which appears to be, at the moment, the most complete for the western regions of the Near East, to pin down the Yumuktepe occupation within contemporary regional developments. The correspondence is based upon a comparison of the

ceramic assemblage (Balossi Restelli 2006). The whole interval of the Neolithic occupation of which I will talk should be dated, using 2 sigma calibration intervals, between 7075 and 5805 cal. BC and it precedes the introduction of painted ware at Yumuktepe, which is dated, with 5 charcoal samples, to a period between 6063 and 5723 cal. BC (2 sigma) and corresponds to Garstang's levels XXV–XXIV.

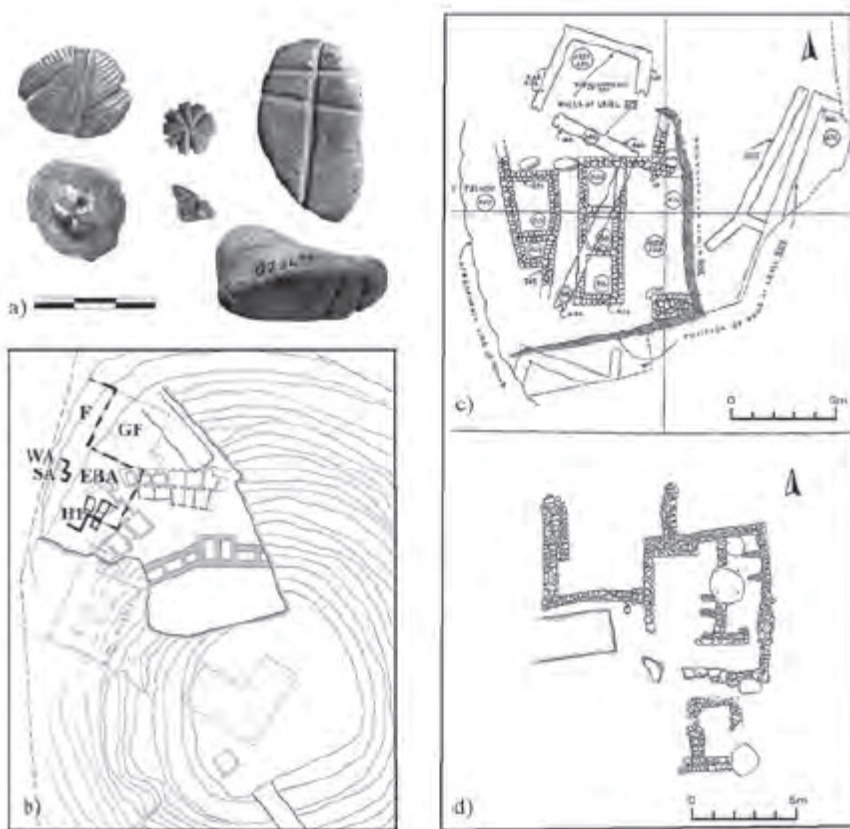


Fig.9.1 a) seals from the VII millennium BC occupation at Yumuktepe; b) northern part of the mound with indication of the excavation trenches mentioned in the text; c) Garstang's level XXVI; d) level XXVII from the recent Italian excavations.

Of this long Neolithic sequence, only the topmost 3 m are excavated over a greater extent (levels XXVII–XXIV). The layers of main interest at the present symposium though, are the earlier ones, investigated only in a very small deep sounding (Garstang trench A and Caneva trenches SA and WA) 2 m wide and 7 m deep (Fig. 9.1). Trench WA has reached virgin soil 80 cm under the bottom of Garstang's trench A. Five distinct levels have been identified in this trench before reaching virgin soil, all dating to a pre-XXXIII level according to Garstang's stratigraphy. In trench SA, in contrast, twenty-five levels

are identified, in comparison to the six stratigraphic levels identified in the neighbouring and twin trench A excavated by Garstang.

Architecture and small finds

No architecture has been uncovered in trenches A, WA nor SA, even though structures with stone foundations are visible in the section of the mound eroded by the river. Important concentrations of sherds have been found in and around some irregular pits (Caneva pers. comm. 2009). Wattle and daub fragments have been uncovered during their excavation. Amongst the earliest occupation, the levels exposed to a greater extent by the Turkish-Italian team are XXVIII–XXVII and that exposed by Garstang is level XXVI. Domestic architecture, with stone foundations, has been found in these levels. Garstang did not identify any mud, wattle and daub or brick superstructure and the recent excavations have certainly confirmed the absence of mud bricks. The earliest, more complete plans identified are those of two single rooms, possibly belonging to an unexcavated larger structure, and those of two multi-room buildings (Caneva 2004; Balossi Restelli 2006). The multi-room building found by Garstang has a tripartite plan, interpreted as a storage area because of the small dimensions of the lateral rooms and the apparent absence of doors (Fig. 9.1). Room A306 is larger and is seen as a possible area of domestic activities. Similarities in plan are visible with tripartite structure 72 from Ain el-Kerkh, dated to Rouj period 2c (Tsuneki et al. 1998). The building uncovered at Yumuktepe by the recent excavations has a clear domestic character, with larger rooms and two niched areas interpreted as hearths. The floors unfortunately have not yet been identified and thus no certain in situ material has been recorded. Room A25, of an earlier level, has interesting in situ material and has been interpreted by Caneva as a storage room. In it were many pieces of clay basket linings and bins.

Amongst the most interesting and meaningful finds of these levels are four stone and bone seals, all similar to those found in the contemporary site of Ain el Kerkh (Tsuneki et al. 1998, 1999, 2000). Three are from the pit area in the earliest levels of occupation, one from storage room A25, and another from the multiple-room building in trench EBA (Fig. 9.1).

The ceramic assemblage

Data on the ceramic production of the earliest levels is limited to 633 sherds from the recent Turkish-Italian excavations, amongst which

there are no entire vessels, whilst published material from Garstang's excavations consists of approximately 10 pieces of pottery (Balossi Restelli 2006). It is thus extremely difficult to discuss issues of shape and function, and meaningless to present percentages of wares. This ceramic production can be analysed only in comparison with the later one, where data is greater and can thus help to hypothesise changes and give some meaning to this small sample.

Soundings SA and WA, the ones that go down to the earliest levels of occupation and reach virgin soil, have produced a total of 314 sherds. The trenches are too small to calculate an average density of sherds per m³ of soil.

In the lowest levels of the deepest trench WA, which reaches virgin soil, there is one class of pottery, a light burnished and slipped, grit tempered ware, whilst a Dark Faced Burnished Ware, which I shall describe below, appears in its later levels. The light coloured burnished ware has homogeneous medium size grit inclusions; the abundance of the inclusions gives a sandy look to the ware (Fig. 9.2). Most of the mineral inclusions are white and clearly visible on the interior surface. Fragments are quite thick, ranging around 8–10 mm along vessel walls and 10–15 mm at the base. The surface appears to have a light coloured slip cream to pinkish or buff. As noted above, no whole shapes have been found, but flat bases appear to be typical of this ware. A single rim of this ware has been found. Shapes were probably flat-based hemispherical bowls. In the English excavation reports, a salmon-pink slip on a brown ware, or pinky-yellow slip on a grey core is described from the earliest levels of trench A and might correspond to this light slipped ware; the two bases illustrated also confirm that the bottoms were flat (Garstang 1953: fig. 11:5 and 7). This ware is found directly above virgin soil and continues throughout trench WA, but starts to disappear in the higher trench SA, where only a rare and random sherd is found. It would thus appear, on the basis of both the Garstang reports and the more recent Turkish-Italian excavations, that this light slipped and burnished, sandy to touch ware was the only pottery of the earliest ceramic production testified at Yumuktepe. I should again recall, however, that we are talking about a deep sounding, thus further excavation will be needed to validate this observation. The single radiocarbon sample present for this phase gives a 7920 ± 90 date that, calibrated, has a 2 sigma interval of between 7075 and 6512 cal. BC. Stratigraphically, I emphasize again that we are earlier than Garstang's level XXXIII.



Fig.9.2 Light coloured burnished and slipped ware of the earliest levels of occupation.

If this is the earliest pottery produced at Yumuktepe, what was it used for? The rarity of sherds found and the absence of whole shapes does not help in reconstructing its use. As for use wear, some irregular darker marks are visible on the exterior of a single base of this ware, which look to me more due to an irregular firing of the pot than to its use over fire. Was it actually due to cooking, however? Because of the uniqueness of this case, I do not believe that there is currently any proof that this ware was made expressly to be used for cooking. These pots could have been used over fire, but it does not seem to me that this was their primary or sole function. Furthermore, is it correct to imagine that ceramics start being produced in order to ‘revolutionise’ food preparation habits or is it not rather the inverse, that cooking is a consequence of ceramic production?

Since the inception of technological and archaeometric studies on ceramics we have become used to looking for technical characteristics indicative of function (Le Mière and Picon 1998). The burnishing and flat base in this case would not help if the pot was used over fire; the impermeability would rather suggest suitability for storing liquids (Wallace 1989). Technical characteristics though might not only have a functional meaning, but might have been chosen for some other

non-functional importance (e.g. social value or ritual) (Pfaffenberger 1992; Sillar and Tite 2000). Were pots made with a flat base because their immediate models were baskets and bins, containers known since the PPN? Or because they stood more steadily on the ground? Were they burnished because of their importance as new objects (Dobres 2000)? The shapes of this early ware, from what can be envisioned on the basis of the sherds found, do not show any functional specificity, but are rather basic and simple. A multifunctionality of containers might correspond to this absence of specificity. Thus these pots could have been used for various activities, perhaps including cooking. Their initial use as containers of multiple types of things since the PPN, a function for which bins and baskets were used and a subsequent use as cooking pots could indicate a gradual change in food habits somehow triggered by the presence of pottery. As you will see below, the analysis of the ceramic production of the following levels at Yumuktepe will argue in favour of such an interpretation.

The first DFBW is found in the two latest levels of trench WA and then throughout trench SA. This starts as a single undiversified DFBW group but will gradually become more specific, with the formation of three distinct types of DFW in later Neolithic phases of the site, as I will describe below. The DFBW found in the later levels of trench WA (levels 1 and 2) and in the lower levels of trench SA, thus dated to Garstang's levels XXX–XXXIII and earlier and contemporary to Rouj 2a (Tsuneki and Miyake 1996; Miyake 2001), is, as is typical of DFBW, mineral in temper, but never black or dark grey in colour; the main colours are browns and scarlet-brown, but reddish brown is present too. Other characteristics are a fine texture and rather thin, regular profiles. No particularly coarse vessels are present, nor are there any very fine ones. Also, shapes suggest some differences with the later typical DFBW since two flat bases have been found. In the following Neolithic layers, excavated extensively and thus with thousands of DFBW sherds, not a single flat base has been found. Flat bases recall the earlier and still present light slipped and burnished ware. The most common shapes, though, are of round based bowls, mostly with inverted profiles, resembling whole-mouth jars. On these sherds possible sooting deposits start to be observed, thus suggesting use over a fire for at least some of these vessels. Ceramic technology had now certainly been put to use for the processing of food and cuisine.

In the upper levels of trench SA and in the earlier levels of trench EBA, corresponding to Rouj 2b, there is a further change in the wares present. The light burnished and slipped ware is only present as a

couple of sherds, possibly out of context, whilst alongside the DFBW is an unburnished Dark Faced Ware (Fig. 9.3). This is similar to the former, except of course, in the surface finish. This gives a somewhat more dull shade to the colour. Texture, too, is at times coarser. Shapes are more commonly wholemouth jars or the usual bowls with inverted profile. Globular bowls are found also. The majority of sherds of this ware have sooting deposits (Skibo 1992). In my opinion, this is the first moment at which we can hypothesise that potters at Yumuktepe have undertaken technological changes to pottery manufacture to create vessels with a specific use as cooking pots. The absence of burnish gives greater transpiration to the vessel walls, decreasing the risk of fracture when on a fire (Tite and Kilikoglou 2002). The same can be said of the coarser texture, which increases porosity, and of round bases. With this I do not mean to say that they were exclusively used over a fire, but that this is, in my opinion, the first case in which a specific technology was followed to make functionally specific pots; the fact is not of minor importance that the first function for which pots are expressly made is that of cooking.

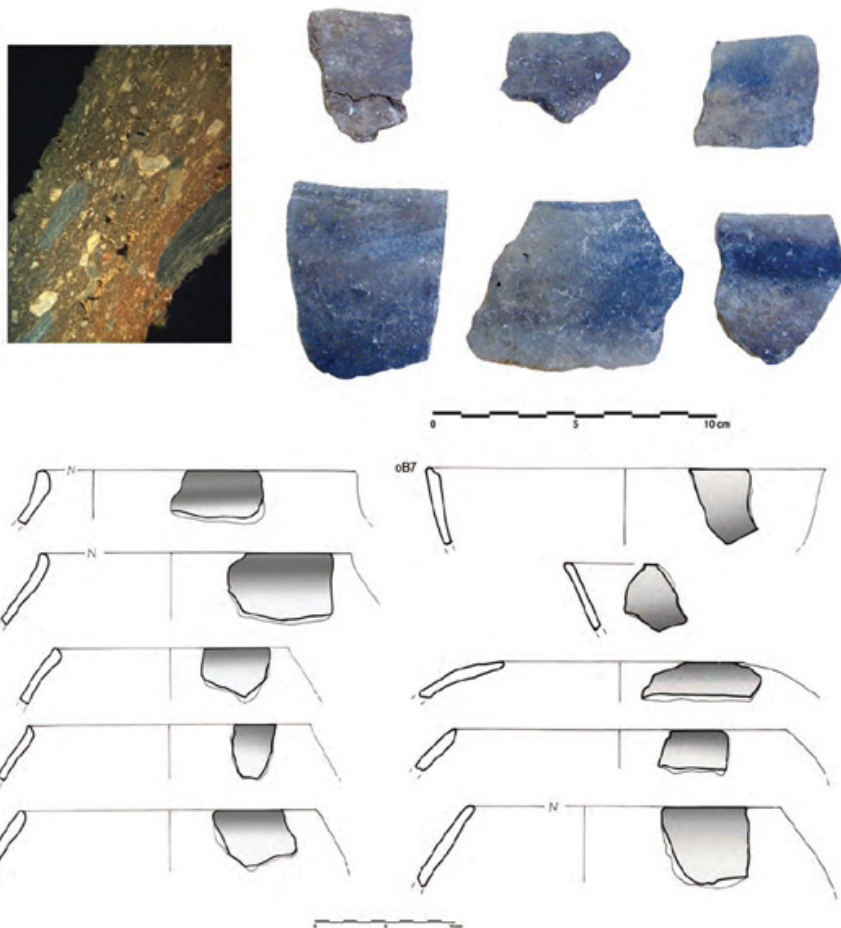


Fig.9.3 Dark Faced Unburnished Ware.

The Dark Burnished Ware of these levels still has the characteristics described above, but impressed decoration also appears (Fig. 9.4). If the Dark Unburnished Ware was used for cooking, the Burnished Dark Faced Ware, still shaped in hemispherical bowls or bowls with slightly incurving walls and relatively small in size, with the largest pots having volumes generally around 1 l and never beyond 2 l, was probably used for food consumption and/or short term conservation of goods. The exclusivity of decoration on this ware might be explained by the use of these bowls in intra- or inter-community events implying food consumption, where symbolic gestures and signs might have been more evident than in cooking activities (Gosselain 1999). It is interesting to note that this is the first time that decoration appears, thus not immediately with the inception of pottery making but at a slightly later stage, when, maybe, wares and shapes, as well as the

role and use of the pots, have become more formalised and systematic. Before this, means of symbolic expression, surely abundant in the PPN, must have still been on other objects or elements of material culture, as clothes, headdresses, mats etc.



Fig.9.4 Dark Faced Burnished Ware from trenches SA and F2.

The following, more extensively excavated levels are those corresponding to Garstang's levels XXV–II–XXVI. Nearly 22,000 sherds were analysed from these levels. In this phase, alongside the dark wares, a completely distinct ware appears (Burkitt 1939). This is a light coloured ware, with surface colours ranging from pinkish to cream or light orange (Fig. 9.5). A very small number of sherds of this ware were found in the earlier trench F2, but were probably out of context. It is grit tempered, with clearly visible red, white and black coloured grit inclusions. The texture is medium to coarse but wall thickness is rather thin, mainly 6–7 mm. The surface is untreated but some rare sherds have a simple incised or nail impressed decoration. Shapes indicate that there are essentially short necked jars in this class. I believe that we are now finally looking at the birth of yet another functionally specific shape and ware: that of storage jars. We note that the light coloured ware in these levels is the most abundant ceramic present. There is furthermore some variation in surface

treatment and decoration within this light coloured ware.



Fig.9.5 Light Coloured Grit Tempered Ware from levels XXVII–XXVI (trench EBA).

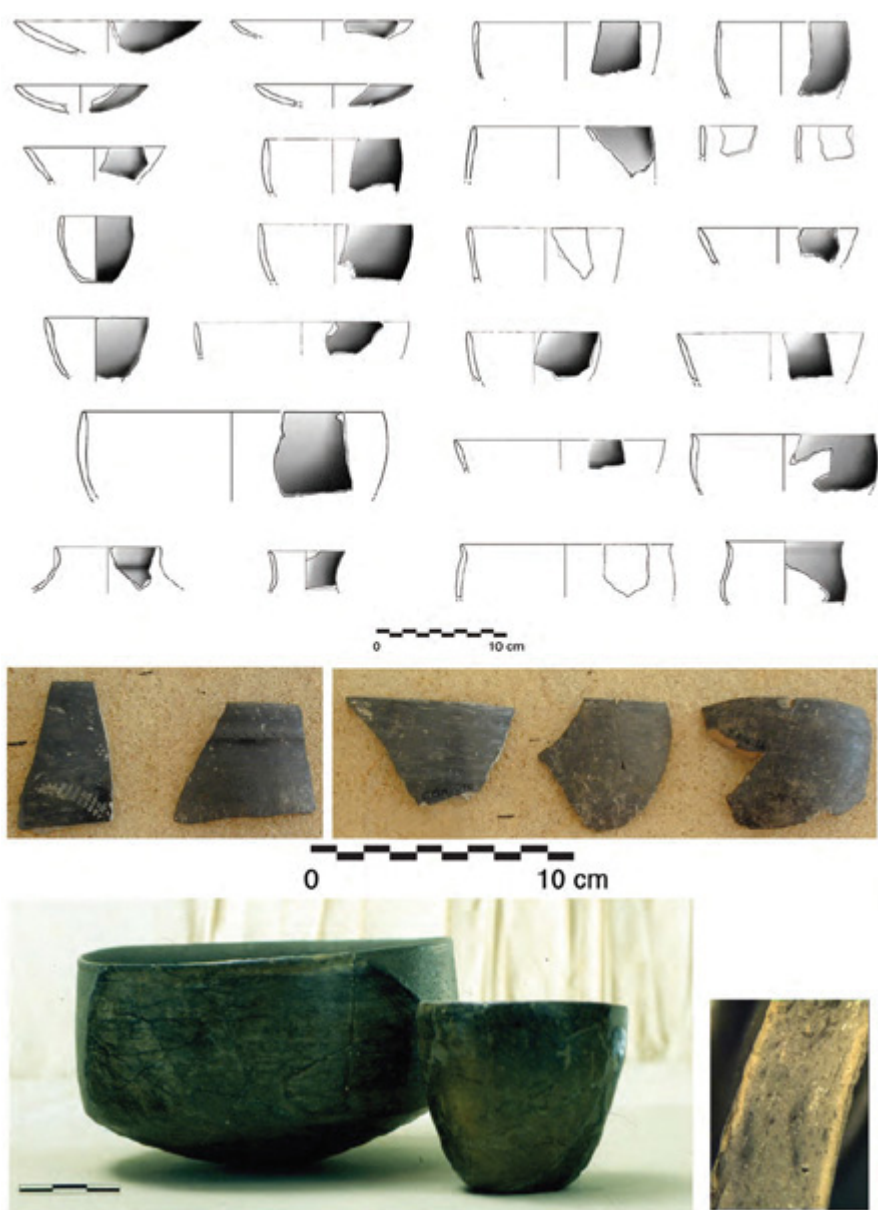


Fig.9.6 Very Fine Dark Faced Burnished Ware from levels XXVII–XXVI (trench EBA).

A small minority of sherds stand out because of their smoothed surfaces, a generally more reddish colour and with thicker profiles (5–12 mm). Here too shapes are generally jars, with a less pronounced neck compared to the rest. Rare cases of a red wash, a slip or a burnish are found amongst this pinkish coloured ware. These varieties are important in that they indicate an ever increasing desire to distinguish groups of pots, be the reason functional or symbolic.

We have started with a single ware at Yumuktepe and have now

ended up, possibly in a little less than one millennium, with at least three distinct wares which correspond to three broadly distinct shapes and thus possibly functions. Within these, minor differences might yet suggest meaningful distinctions in use, manufacturer, ownership or symbolic significance.

Further confirming this is the appearance in this phase of yet another ware: a Fine Dark Faced Burnished Ware (Fig. 9.6). This is mineral tempered, as were all wares at Yumuktepe, but with such a fine texture that inclusions in the paste cannot be distinguished by naked eye, or even by microscope. No vegetal inclusions are present. The other characteristic element is the fineness of vessel walls: these range from 2 to 6 mm. The surface colour of this category is mostly light or dark grey, often black and more rarely light brown or buff, and with a rare red slip and burnished. The surface treatment of this ware is the other stunning peculiarity, since many sherds are polished and shiny (more than 60%) and the others accurately burnished. Rarely some sherds evidence an impressed decoration, generally obtained with a three or four toothed comb instrument pressed on the surface in order to form series of curving lines. Shapes of this ware are bowls, plates and goblets, all small in size, with the largest bowls possibly having a volume of a little more than 1 l and in general being below that capacity, the small plates between 100–200 ml, the same as goblets. Shape and size clearly indicate, in my view, a very specific use for these vessels for food consumption – eating and drinking. The particularly well executed surface treatment might then indicate the relevance of the context of use. These might be vessels used on special occasions, in feasts or community commensality. Parallel to this is a change in the rest of the DFBW, the type that had appeared since the lower levels of occupation at Yumuktepe. Wall thickness is still rather homogeneous even though sherds are slightly thicker than before. Surface colour can now also be black and grey. Granularity is not so fine as previously and pastes tend to be medium-fine in texture. Shapes tend to be less deep and with more open profiles than earlier (Fig. 9.7). Lastly, but most meaningfully, impressed decoration is absent. Only two small sherds might have a pattern burnished decoration, which would recall attributes characteristic of the Amuq and Rouj DFBW. The disappearance of the decoration from this ware might further argue in favour of the fact that it is the Fine Dark Faced Burnished Ware which is now used in more important and symbolically charged events.

Linked to this observation of the role and symbolic meaning of these ceramics is their colour. In fact, the cores, with alternating dark and

light sections (Fig. 9.7), suggest that the dark surface colour of the Fine Dark Burnished Ware was expressly sought (Balossi and Morbidelli 2005). Yumuktepe potters are deliberately making pots used for food preparation (cooking pots) and consumption, both for daily domestic life and special community events, in dark colours, whereas pots used for storage are always pinkish, cream or buff in colour. This indicates a desire to clearly distinguish these two functional contexts, probably suggesting an important symbolic distinction either between food processing and consumption, and goods conservation, or between the contexts in which these two kinds of activities took place (Arnold 1986; Gosselain 1999). Thus, in this phase wares are not only somewhat function specific, as already suggested for the immediately preceding period, but the whole ceramic assemblage becomes strongly charged with symbolic meaning and style has probably acquired a codified and formalised value as a mean of communication within the community and in inter-community relations.

Archaeometric analyses bring some interesting observations on the techniques of pottery manufacture for these early phases of production. Chemical and mineralogical analyses have shown that the light coloured ware and the Fine Dark Faced Burnished Ware have a similar paste composition, despite having distinct granularity and quantity of inclusions. This is visible by a comparison of mineralogical X-Ray powder diffraction (XRD) analyses of samples of these two classes. The samples overlap perfectly (Balossi and Morbidelli 2005). Chemical analysis (ICP-AES) gives similar evidence. When samples are plotted against specific chemical elements, it can be observed that samples from these two classes particularly cluster together. What changes completely is granularity, with an extremely fine texture in the case of the Fine Dark Burnished Ware and a medium-coarse paste for the light coloured ware (Figs. 9.6 and 9.7). Thus the paste of these two classes is made with the same raw material but techniques of manufacture are completely distinct as is surface colour. The cooking ware too demonstrates this as it is the only class with a wide variability in grain size of non-plastic materials within the same sherd (Fig. 9.3), a characteristic that increases porosity and is thus especially useful when the pot is heated (Bronitsky and Hamer 1986). Paste texture, porosity and granularity thus appear to be relevant in ware distinction. Manufacturing techniques, rather than the choice of raw materials, would seem to distinguish one ware from another.

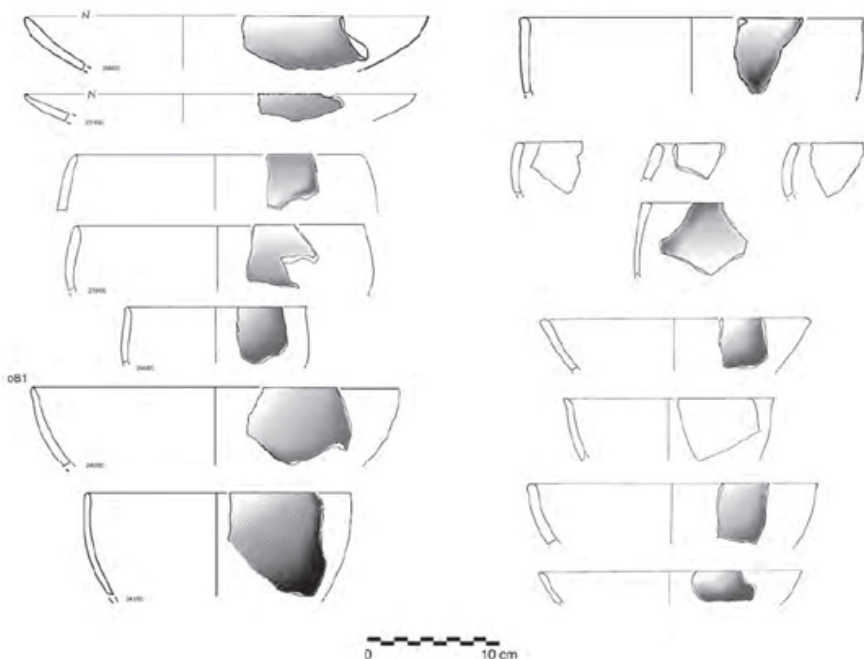


Fig.9.7 Examples of the most common shapes of the Dark Face Burnished Ware of levels XXVII–XXVI (trench EBA).

The Yumuktepe phases we are looking at, which have developed these three distinct dark faced wares, are, as I have said, levels XXVIII–XXVI. On the basis of the attributes of the ceramics (for example the increase in fine textures of the dark coloured wares, the better quality of the burnish, the decline in impressed ware and pattern burnish decoration) and, according to the absolute chronology, I believe these levels correspond to Rouj period 2c. In this period DFBW, abundant since much earlier in the ‘core’ region of production, which comprises Cilicia, the Amuq and Rouj, is shared over a vast area, certainly reaching Hama to the south and the Qoueiq to the east. DFBW, or DFBW-like pottery, is subsequently also found yet further east, up to the Balikh, and even further south, to Ramad, and north, possibly to the Turkish tract of the Tigris river. In a less obvious way and with a smaller area of distribution, DFBW acts something like Halaf painted ware will at a later date. As a ceramic used in moments of food processing and consumption, DFBW travels, possibly testifying to commensality and feasts participated in by different kin groups to confirm and regulate their ties (Wright 2004). Thus again we notice how certain pottery has acquired, even at a supra-regional level, a highly symbolic value as well as being effectively used for some more practical function.

Then something else happens. Painted pottery appears and this

corresponds to a marked decrease in and subsequent disappearance of DFBW. This is visible at Yumuktepe, in Garstang's layers XXV–XXIV, and in the Rouj during period 2d. In the Rouj, in this period, faunal data at Ain el Kerkh seems to indicate a shift from cattle and pig exploitation to a primary economy which is mainly based on sheep and goat (Tsuneki et al. 1998: 28). At Aray 2 and Kerkh 2 this change might have already started in Rouj 2c (Hongo 1999). Could this suggest a more mobile way of life? At Yumuktepe, the faunal data seemingly indicates a strong decrease in pig and cattle and an increase in sheep and goat in levels XXVII–XXVI (Rouj 2c) (Minniti pers. comm.; Buitenhuis and Caneva 1998). Furthermore, Yumuktepe XXV and XXIV have large animal pens but, most interestingly, an area with a strong concentration of large siloi, plausibly used for the storage of staples (Caneva 2007). Their concentration in one single area of the site might indicate that they contained goods belonging to different people or families who left for part of the year with animals, leaving behind their food reserves. The semi-nomadic life suggested by this data would certainly bring about a growth in the number and types of encounters with other kin and groups living in neighbouring regions (Nieuwenhuyse 2007). If ceramics still preserved its high symbolic meaning, because of its use in inter-community meals regulating kin ties, then we would suspect that the black wares were no longer suitable supports for such a symbolic expression. Monochromy or, at best, the double colour created by the pattern burnish in use in Rouj 2c did not provide enough stylistic variability. The white paste inlays in incised and impressed decoration, evident in some rare cases at Yumuktepe XXVIII–XXVI, could be an initial solution for such a problem but, in the end, the best way to obtain an infinite variety of decoration on pots, and thus the greatest range of information, is with painted decoration on light coloured wares (Wobst 1977).

Conclusions

The introduction of pottery and the proliferation of its use certainly had a revolutionary and long lasting effect on the organisation, habits, cuisine and economy of Neolithic groups, which I believe can be best understood by observing and contextualising these changes on the *longue durée*. This has been especially true in the case of Yumuktepe, where data on the earliest pottery is still sparse but, in comparison with the immediately following phases of occupation, has proved to be particularly interesting.

The relationship between technical innovation and culture is bilateral. Habits and behaviour trigger technical innovations, which

also cause changes in techniques. This is why issues concerned with the technical production of pottery cannot be separated from the contexts of use of the ceramics.

At least five steps in the production and development of ceramics have been identified in 7th millennium cal. BC Yumuktepe.

The first is that of Yumuktepe pre-level XXXIII (the lower part of trench WA), where the first pottery is possibly a multifunctional container, perhaps also used on fire but not mainly and not expressly. In this first production, no specificity in raw materials or in shapes has been identified. The homogeneity in technical procedures for the production of vessels and in shapes is most probably the result of cultural expression.

The second step is that of the later levels of trench WA and the lower ones of SA. Here, next to the light coloured burnished and slipped ware of the previous phase, is a DFBW, some still with flat bases, but mostly with a round base. Some sherds have soot deposits. This could be the first tentative evidence of the production of a functionally specialised ware for food processing. Next to this the light coloured slipped and burnished ware with no functional specificity is strongly decreasing.

The third step identified is that of the upper levels of trench SA, in which this focus on processing food with fire has probably contributed to a technical specialisation in the production of cooking ware.

It is in this phase that the Dark Faced Unburnished Ware appears. This no longer has flat bases, has no burnish and a high degree of variability in the size of the non-plastic inclusions; all characteristics which increase evapotranspiration. Parallel to this is the technical development of DFBW, which is at times decorated with impressed designs. This ware is no longer used for cooking but mainly for food consumption and thus begins to be charged with a particular symbolic meaning. Commensalism and food consumption are, in fact, generally involved in routine negotiation and sedimentation of social identities (Jones 2002). This is the first moment in which we notice a clear formalisation of ceramic ware classes.

The next step, step four, is that dated to the last centuries of the 7th millennium cal. BC, which is exposed in trench EBA with the multi-room buildings. At this point yet more functionally specific ware groups are present. Light coloured wares are used for storage and dark wares for food processing and consumption. This strong visual distinction suggests an increase in the symbolic and social value given to pottery, which is confirmed by the appearance of the Fine Dark Faced Burnished Ware, a shiny, attractive ware used in particular

contexts of community feasts or commensality linked to some special event. Contexts of food consumption with a different social importance thus use distinct crockery. The separation between classes is not so much in raw material procurement, but rather in distinct manufacturing techniques, with different grinding, sorting, selection of non-plastic inclusions in the different classes and distinct firing techniques. Technical capacity was high, but not yet interested in the specific properties of materials. Thus, by this time techniques, use and social meaning of pots so permeated one with the other that we can rightly talk about ‘technology’, as emphasised by Pfaffenberger, a strongly culturally determined potter’s craft (Pfaffenberger 1992; Lemonnier 1993).

Finally, step five. To take this further, this process sees the increased need to imbue symbolic meaning through pottery, possibly justified by a greater mobility of some groups and thus the creation of larger kin networks. To this problem, the response is, if we want, a technical solution that introduces coloured painting on the vessels, thus anticipating what will further develop with the Halaf culture.

Turning back to the question of this symposium, pottery production starts at Yumuktepe at the beginning of the 7th millennium cal. BC in a context of a fully sedentary, farming and herding community. The most proximate ‘technical’ antecedents of pottery are mud bins and mud lined baskets, found at Yumuktepe but common throughout the PPN sites of all of West Asia. Technical knowledge is also testified, at many PPN sites, by the long use of mud for wattle and daub architecture and figurines, and by the control over firing techniques used in lime plaster preparation.

The absence of PPN levels at Yumuktepe prevents us from seeing exactly how the introduction of pottery relates to possible changes in cooking and cuisine (Goody 2000), but the lack of univocal use-wear traces or paste and shape specificity has brought me to hypothesise that it is rather the multi-functional nature of these early containers that had the effect of changing food habits and not vice versa. From then on, however, it becomes difficult to say which is the cause and which the effect. Pots are put to new uses thanks to technical changes aimed at obtaining the ‘best’ qualities for such needs, but needs also become such because there is a technology that can support them. Technological innovation and cultural transformations thus develop in parallel, alternatively one triggering the other and inevitably one conditioned by the other, both contributing in shaping societies.

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Chapter 10

Merging Clay and Fire: Earliest Evidence from the Zagros Mountains

Reinhard Bernbeck

Introduction

This paper discusses the emergence of pottery in the Zagros mountains. I provide a theoretical framework for innovation studies which emphasizes notions of receptivity, implementation as a process rather than an event, the seat in life of the newly introduced object class, and the potential consequences of a set of new items in a material culture, namely a change in collective subjectivity. I illustrate my arguments by analyzing the archaeological evidence from two regions, the western and the southern Zagros mountains. I conclude that pottery studies need to be more attentive to use analyses to be able to account for complex processes such as the emergence of pottery.

Theoretical aspects: from invention to implementation¹

“From time immemorial people have believed that in demonstrable purposes, in the usefulness of a thing, a form, or an institution, they could also understand the reason it came into existence – the eye as something made to see, the hand as something made to grasp.” (Nietzsche 1997–2010).

In his *Genealogy of Morals*, Friedrich Nietzsche argues that the most basic function of an object or object class and its origin are all too often assumed to be inextricably related. The function-origin nexus then serves as a hidden agenda to determine the ‘essence’ of such objects. More recently, Foucault (1971) and Agamben (2009: 101–138), and in feminist archaeology Conkey (Conkey with Williams 1991) have elaborated on that critique for disciplines that investigate the past. I suspect that ideas about the introduction of pottery in the Neolithic of ancient Western Asia have often fallen prey to this logic, the search for the ‘original’ contexts that then would reveal the most basic function of ceramic vessels.

Interest in the emergence of pottery in Western Asia has recently focused on the Levant and Northern Mesopotamia because this is the

region where such objects presumably appear earliest (e.g. Nishiaki and Le Mièrè 2005). Here, I will elaborate on the earliest pottery in the Zagros and beyond. A return to this region² is particularly important as it removes the focus from the search for origins and why people used pottery in an ‘earliest place’. I submit that we need to be more interested in the social emplacement of innovations in different regions and sites than in the search for one single point of origin, a place of invention. This also leaves us some space to consider general relations between materiality and people in history, and to think about technological and other innovations as processes of embodiment. I propose that we should not talk about the emergence of pottery or any other kind of material item in terms of ‘invention’ and subsequent ‘diffusion’, as did the well known geographer Hägerstrand (1968). The primary invention, a ‘first’, is decidedly not of major importance. Instead, we need to consider more closely the situated specificity of the implementation of a new material. Otherwise, we run the risk of assuming that the appearance of pottery or other object classes was the outcome of a singular idea of some creative individual.³ Such a Leibnizian concept of the artist-scientist as the socially independent, hyper-talented subject, a creative maker who has the ability to catapult him/herself outside of worldly influence to complete what nature left unfinished, still pervades dominant ideologies and manifests itself in popular excitement when archaeologists discover another ‘most ancient’ phenomenon, whether Paleolithic flutes, the oldest ‘temple’, the earliest domestication of sheep, or the first pottery.⁴

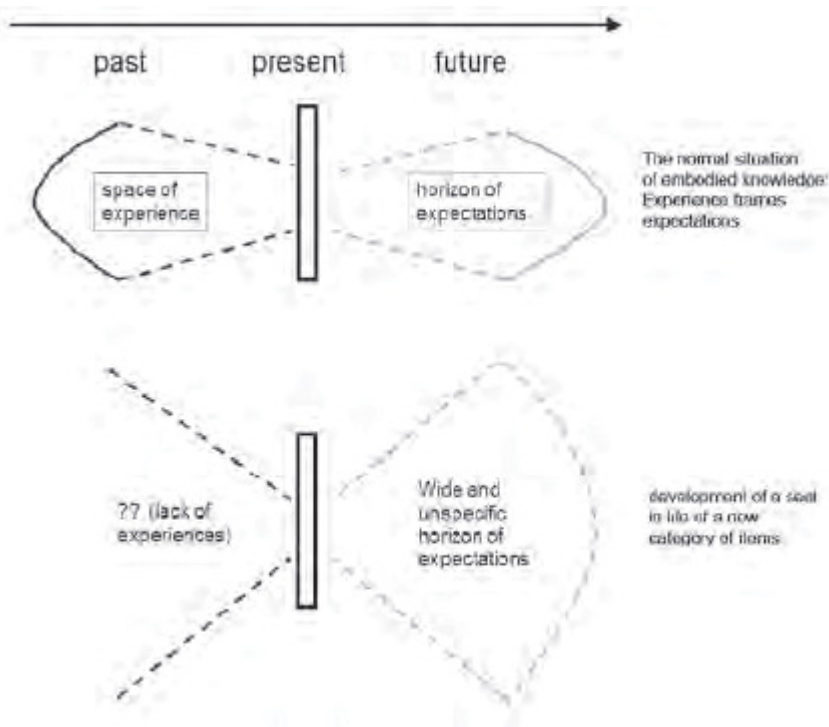


Fig.10.1 Scheme for the relation between experiences, expectations and a 'seat in life' for new categories of items.

The ensuing archaeological narratives assume that the new idea and its materialization are easily accepted by others. This may be so, but only when there is already a pre-existing receptivity for a new kind of material. When receptivity is not problematized, we end up with a history that cannot explain the appearance of new classes of material culture because they are reduced to a function that is derived from later, already established contexts. A focus on the technological issues that accompany the production of a new item, whether in purely functional terms or as technological style (Lechtman 1975; Lemonnier 1992; Pfaffenberger 1992), is equally insufficient as the social conditions of implementation are undervalued. An understanding of such conditions is only possible if we deliberately blur two fundamental categories of archaeological research.

The first is time. A temporal bracket for the emergence of an object class such as pottery must not be reduced to the triad of 'before', 'moment of appearance' and 'after'. The general situation of a site, its structure, relations with others and daily practices carried out in it, can enlighten us about issues of receptivity as well as the potential for resistance to new and therefore unusual items (Bernbeck 2001). Between the extremes of embracing and rejecting the new by some

group or sub-group, there is a wide range of possibilities for partial adoption. Particular emphasis must be put on the potentially multiple ways of using unfamiliar, novel objects in daily life. We cannot expect implementation processes to consist of a largely unproblematic, almost momentary switch from a lifeworld without a whole category of objects to one that uniformly contains it, not even at the level of a site. Due to lack of experience with a new object class, the horizon of expectations concerning them will be extremely wide. At such a historical juncture, any archaeological explanation that tries, for example, to account for the emergence of pottery through three scenarios (e.g. Skibo and Blinman 1999: 173) or one alone (e.g. Brown 1989; Hayden 1995) can only be unrealistically reductionist.⁵

The second blurring of boundaries concerns the realms of production and consumption. If we reduce our reflections to a consideration of pottery alone, we turn a wide-ranging change in material culture into a simple technological development. With such an approach, we risk projecting our own capitalist lifeworld with its instrumentalist thinking into the past by turning history into nothing but a process of ‘problem solving’. Such an approach to history implies a scientific habitus where an innovation is conceptualized in analogy to the search for a vaccine against HIV or swine flu, where an urgent, explicitly formulated problem of global scale is explicitly recognized and standardized, routinized lab procedures are employed for a solution (e.g. Schiffer 2005). Non-industrial societies do not ‘solve problems’ in such a goal-oriented way (see also Vitelli 1999: 184) by delegating such tasks to a specialist body of people who treat a commonly recognized problem. Changes in the realm of technology are not premeditated but more likely the result of playful, communicative, and thus collective processes. The recognition of the usefulness of a novelty should therefore be conceptualized as a complex, multifarious stream of practices (Fig. 10.1). This is characteristic of a situation in which there is a prevailing lack of experience in engaging with an as yet barely known object category or material, and a concomitant large horizon of possible expectations associated with it (Kosselleck 1979). The process of a convergence towards what I will call a seat in life⁶ of a new material category was a drawn-out, gradual process. The length of this process, which leads from ‘multidirectional groping’ to one of quotidian tradition, may be much longer than we normally think. Only at its end can we assume the emergence of a routinized way of ‘dealing with’ an object category, a hexis in Bourdieu’s sense (1990: 69–70).⁷ In most cases, it will take even longer for a clear split into maker-users and users-only

to happen, that is a separation of spheres of production and consumption.

The basic approach I advocate is to see the appearance of pottery and other innovations in a specific region as a historical juncture that leads to a collective subjectivity which could see some advantage in adopting this kind of object.⁸ Furthermore, this addition of a category of previously non-existent things to a material world was a complex, locally specific process with potential resistances. Finally, we need to consider the variable length of time it took for a convergence towards the establishment of what Pauketat (2001) calls a 'tradition', a setting where daily practices flow from an established habitus. Such an approach implies that our principal interest in technological change is not so much the cognitive capacity and bodily skill of the makers as the collective process of a changing subjectivity. This includes both maker-users and users-only of the newly implemented items.⁹

Methods of research

How do we assess such wide-ranging issues as subjectivation processes and the receptivity of a local group towards a new kind of object such as pottery? A brief look at our own documentation systems in archaeological excavations reveals the intense interest in the production side of pottery, indeed a productionist bias (Miller 1987, 1995).

We do not have many problems with the development of methods that elucidate the making of things. Archaeology in general has developed into a direction that is obsessed with the creation of objects, a distant echo of archaeology's origins in art history. After some early days when researchers were fixated on shape and decorative design, our descriptions of pottery nowadays often make use of sheets where multiple variables are listed for each sherd. These concern fineness of clay, kind and quantity of tempers, ways of shaping such as coils or sequential slab construction, as well as surface treatments, slips, self-slips, the degrees of surface smoothing and the types and temperature of firing. All of these variables are supposed to enlighten us about the process of production.¹⁰ In a synthesis we might be able to trace the chronological development of techniques of production. This is still thought of as a state-of-the-art ceramic analysis, and I have succumbed to this norm in the last body of material from Neolithic Iran that I analyzed (Bernbeck 2010; see also Bernbeck 1989).

Such analyses omit at least half of the picture. They follow the 'life' of an object through the process of making it, but stop at that. What

happens afterwards is mostly anecdotically mentioned, unless someone performs a specialist analysis of residues or micro-traces of use and attrition. But it is only here, in contexts of use and consumption, that we can locate the seat in life of pottery. Past peoples did something with the finished pots, and I think there will be agreement when I suggest that this 'post-production' period of the pots' life was in most cases more important than production itself. While research on pottery in the American Southwest, for example, has made significant strides towards assessing the importance of pottery for past lifeworlds (e.g. Crown and Wills 1995; Skibo and Blinman 1999), studies of Neolithic Western Asian pottery use have not gotten much beyond the valuable but outdated cross-cultural synthesis of Henrickson and McDonald (1983; but see Hopwood in prep.) and single-item analyses (Badler et al. 1990). Otherwise, the same across-the-board assumptions prevail that finely painted pots were 'serving vessels', sometimes in 'elite' contexts, and that unpainted coarse wares were, when of smaller size, kitchen wares, and otherwise storage jars for grain or liquids. In other parts of the world, studies that try to unravel the emplacement of pottery in society are much more intricate and have led to highly interesting results. Skibo (1992) has developed a set of methods that can help in the analysis of ceramic vessel use.¹¹ By collecting data on scratches, gouges, marks of burning and soot on sherds and vessels, by analyzing them chemically with gas chromatography/mass spectrometry methods for food and other remains, we can explore what kinds of gestures were performed with vessels, what materials such pots were exposed to, be it gaseous ones such as smoke from a fire, liquids that were stored in them or solid materials such as cooking stones and food items placed in vessels (Evershed et al. 2008; Gregg et al. 2009). Furthermore, we may be able to infer whether vessels touched house floors, walls and other hard items that scraped and rubbed their exterior walls (Hopwood in prep.). In short, we will only be able to assess the changing seat in life of ancient pottery once we have documented use patterns just as intricately as the production variables.¹²

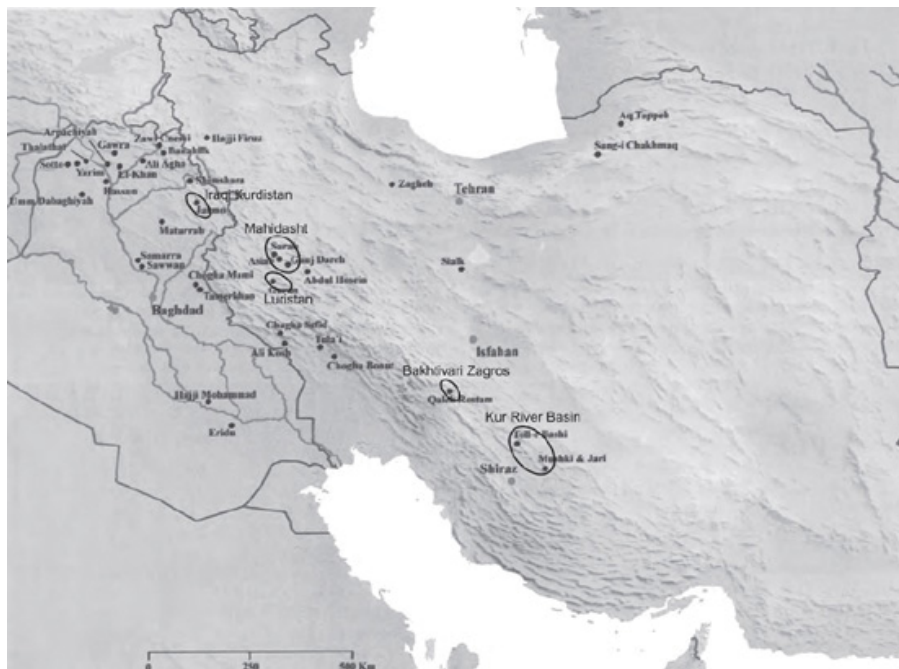


Fig.10.2 Sites and regions discussed in the text.

An intricate knowledge of production and consumption of pottery, derived from a close analysis, is the precondition for understanding its emergence in the Neolithic period of Western Asia. However, there can be no cookbook-like method for this last step of research. Any local context where pottery appears for the first time is likely specific, and receptivity of it is just as much a matter of historical contingency as of potential ceramic vessel function. I now turn to two regions in Iran to elaborate the potential of the approach I outlined, but also to identify areas where we lack data.

The implementation of pottery in the Zagros Mountains

I focus on the Zagros mountains and discuss first the western Zagros region with Luristan and the Mahidasht plain,¹³ and then the south-central Zagros ranges with the Bakhtiyari region and the Kur River Basin (Fig.10.2).

Western Zagros sites

Tepe Guran is the most important site for a consideration of the emergence of pottery in the western Merging Clay and Fire: Earliest Evidence from the Zagros Mountains Zagros, as it is here that we can follow the introduction of pottery in the transition from Phase T to S

(Meldgaard et al. 1963). Tepe Guran is located in Luristan, a region that borders both the lowlands and, to the northwest, the Mahidasht with the present-day city of Kermanshah. Zeder (2006: Table 14.2) recently published a long list of AMS radiocarbon dates that were run on animal bones. According to these determinations, levels T through R should date to c.7100 to 6800 cal. BC. The earliest vessels at Guran are made in so-called “Undecorated Greyish Brown Ware”, a pottery without temper or decoration. This ware is only very lightly fired and is stratigraphically restricted to levels S through O. Archaic Painted Ware (Fig. 10.3) appears slightly later; it is tempered with coarse chaff. Painting consists of reddish lattice-like patterns and some sherds are slightly burnished (Meldgaard et al. 1963: Fig. 16 a, b). Finally, an undecorated, chaff-tempered “Buff Ware” is the most common in many of the early levels. Vessel shapes tend to be round-walled and low (Meldgaard et al. 1963: Fig. 16c), developing later into deeper forms (Meldgaard et al. 1963: Fig. 16h). Standard Painted Ware is important for chronological purposes because two designs occur at Tepe Sarab (‘Sarab Tadpole’, Levine and McDonald 1977: 40) and Jarmo (‘Jarmo Style’, oblique lines of droplike elements; Fig. 10.3). Another design identified is called ‘Sarab Geometric’ (Meldgaard et al. 1963: Fig 18) and is associated with shapes similar to those with ‘Sarab Tadpole’ style. Only in late levels J to D do we find a ‘Close Pattern’ or ‘Guran Style’ (Mortensen 1964). Red Burnished Ware is also restricted to the later levels at Guran.

From this description, it is clear that variability in wares was initially low but developed rapidly into larger numbers of wares with multiple designs. The instigation to make pottery was probably not related to large scale tasks since vessels are small and tend to be shallow (Fig. 10.3). Thus, a search for objects whose liquid content will not spill was likely of no major consideration. A point of relevance is the first appearance in level P of oval shaped mud brick for house construction, whereas huts from all earlier levels were made of wood (Meldgaard et al. 1963: 110–112). Clearly, in the case of Guran, the appearance of pottery precedes the use of plastic clay for architecture. However, clay figurines seem to occur as early as the pottery.

Another site, Ganj Dareh in the Kermanshah region, dates several hundred years earlier (Zeder 2006: Table 14.2) and gives us a better hint at the complexity of the appearance of pottery. The excavator, Philip Smith, reports the appearance of small amounts of pottery in most levels of this ‘aceramic’ mound, starting with shaped clay fragments and a single sherd with incisions in the earliest level E

(Smith 1974: 207), dated to c.7950–7850 cal. BC. Later levels also contain examples of this ware, often with a decoration consisting of finger nail incisions (Smith 1968: 159).¹⁴ The pottery from Ganj Dareh was apparently not fired and is so coarse that in one place the excavator calls the larger pieces “storage devices” (Smith 1990: 333). Most of what we know about these bins is due to a major conflagration in Level D, dated no later than 7750 cal. BC. In this level, a number of large containers, one with a height of 0.80 m, were fixed into walls and floors of the buildings. The buildings themselves, made of mud brick, had extremely small rooms that lent themselves to such fixtures. In the same level D, a few remains of very small vessels were found (Fig. 10.4). The latter may have been slightly fired (Smith and Crépeau 1983: 56).¹⁵ Interestingly, Ganj Dareh is usually categorized as aceramic, even though there seem to be enough indications that shaped clay vessels were used. It is a site that is part of the lengthy process of acquiring skills of making and using clay items. From the earliest level on, the excavator reports numerous shaped clay studs whose meaning and use remain obscure. And beginning with the second level D which is well-preserved because of the fire, building material is largely mud, both chineh and bricks. There are several varieties of bricks (Fig. 10.5), a fact that, according to the excavator Smith (1990: 332–333), points towards a time of experimentation.

However, Smith (1990: 334) judges the whole site and its development as “une innovation sans lendemain”, an implementation of technologies that had no future. It is necessary to dwell for a moment on such a statement. Smith does provide clear reasons for why he considers the lifeways of people at Ganj Dareh a failure. In my view, he may have encountered a time period when a relatively new technology was implemented that was still outside of an established relation of peoples’ embodied experiences with wet clay as a material and thus also not linked to specific expectations for its use (Kosselleck 1979: 349–375). This may lead to a situation of ‘collective groping’, of practical trials that have more the character of play with than search for something.¹⁷ Convergence towards routinized gestures in the making and use of items, a hexis, and standardized patterns of production and/or consumption of ceramics are only evident in times after the abandonment of the site. When compared to Tepe Guran, we note that the temporal sequence of using clay for making pots vs. architecture is reversed. Furthermore, a large number of small figurines and abstract clay objects were found at Ganj Dareh (Fig. 10.6; Broman Morales and Smith 1990).

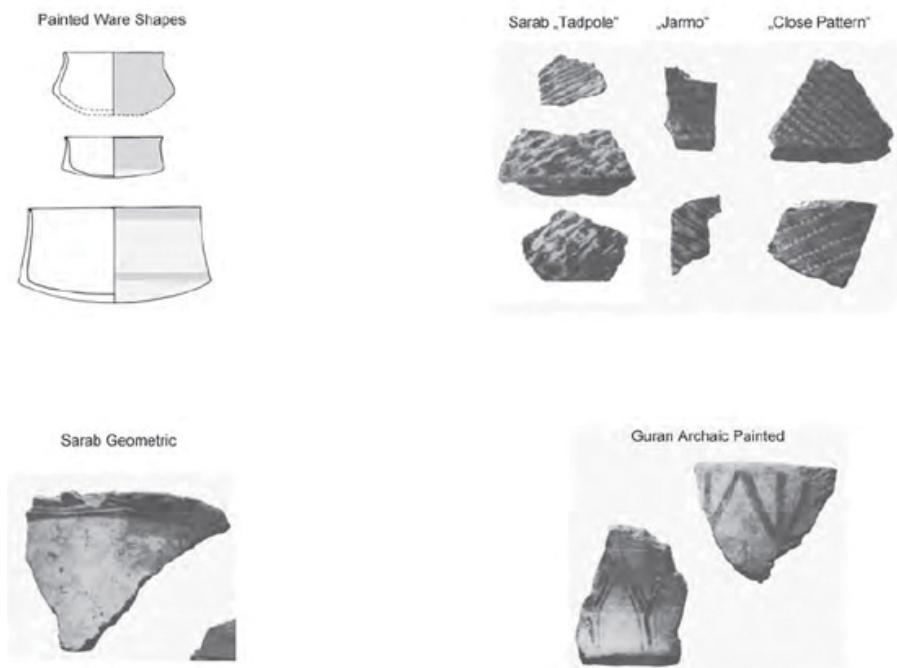


Fig.10.3 Tepe Guran pottery decoration and shapes. After Meldgaard et al. 1963: Fig. 16, 18.

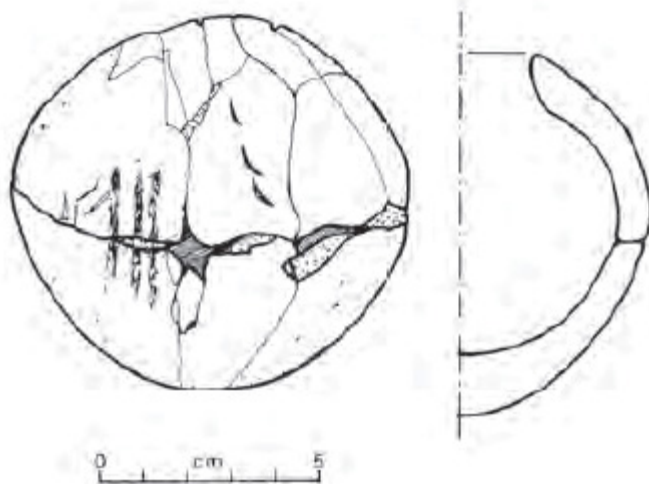


Fig.10.4 Ganj Dareh miniature, slightly fired pottery vessel. After Smith and Crépeau 1983.

If we analyze the situation in terms of a complete *chaîne opératoire* for pottery making, we find that all the elements of the chain were known by the people at Ganj Dareh (Fig. 10.7): the general knowledge of the properties of clay when mixed with water is attested in

figurines, vessels and bricks; the use of temper and the shaping of two sizes of containers in the unfired vessels. The firing of clay items to harden them is mainly apparent in the small figurines and geometric clay pieces (Schmandt-Besserat 1974: 12–13). However, people at Ganj Dareh did not combine Merging Clay and Fire: Earliest Evidence from the Zagros Mountains their practical knowledge of all the necessary steps and associated skills to make ceramic vessels.¹⁸ This may simply mean that receptivity for the intense, quotidian use of mobile, fragile vessels was not present, despite the skills and knowledge to make them.

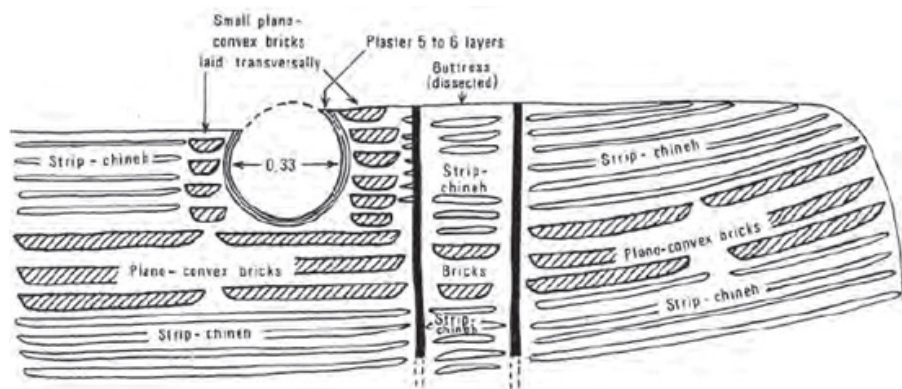


Fig.10.5 Architecture and bricks at Ganj Dareh. After Smith 1990.

One of the reasons why this might be so is to be found in stone vessels of the same period (Smith 1976: 14–15). Such vessels, mainly small open bowls with rounded walls, have been found at many Neolithic sites in the Western Zagros mountains, including Tepe Guran, Ganj Dareh and Jarmo, as well as at Ali Kosh. If there was a need for small containers at Ganj Dareh, these could have been provided by the stone vessels. The larger bin-like containers did not need to be fired because they were stationary.

Jarmo's sequence provides important further insights into the very local nature of the implementation of pottery. Situated northwest of the Kermanshah region in the Chemchemal valley of Iraq, Jarmo is of importance in three respects. First, Adams (1983) divides the sequence at Jarmo into an "Earlier Manifestation" of pottery from Levels II, 3–5 and a "Later Manifestation" from Levels II, 2fl–1. The Earlier Manifestation has clear parallels to the painted Sarab-Tadpole style pottery from Tepe Guran and Sarab (Fig. 10.8; Adams 1983: Fig. 105: 5, 13–15), but there are only a few vessels from those first levels with pottery. Adams (1983: 216) estimates the total number at 35. Then, there is an abrupt change to the Later Manifestation with substantial

numbers of coarsely made, crumbly pots that are characterized by nose lugs, handles and other applications on the vessel exterior (Fig. 10.9; Adams 1983: Fig. 107. 5–8). According to Adams (1983: 222–223), the entire Earlier Manifestation corpus was likely brought in gradually from elsewhere. The undecorated, coarse Later Manifestation vessels are supposed to have resulted from mimetic attempts at copying the earlier ones, but with modifications according to local needs.¹⁹ This may seem likely, as the Early Manifestation Guran/Sarab type vessels differ in use- and not only production-related ways from those of the Later Manifestation. The many exterior attachments for handling vessels, as well as the absence of painting indicate that the later pottery had a fundamentally different seat in life than the earlier one. There is an additional regional dimension to consider. The Later Manifestation has close resemblances to the Sotro horizon of Northern Mesopotamia. Jarmo is situated in a region of overlap of two early pottery-making spheres: the Northern Mesopotamian plains to the west, and the Mahidasht plus related mountainous areas to the south-east. The object class of pottery reached Jarmo from the latter region first, but did not seem to meet with general receptivity. The initial situation was quite similar to that at earlier Ganj Dareh, since skill and knowledge of the properties of shaping and firing clay were present, as some baked clay pits and other items from the aceramic levels indicate (Fig. 10.10; Adams 1983: 222–223). But only when the pottery style from the Western lowlands was adopted – immediately following the appearance of the Earlier Manifestation – was it taken over at a larger scale, leading to local vessel making and frequent use.

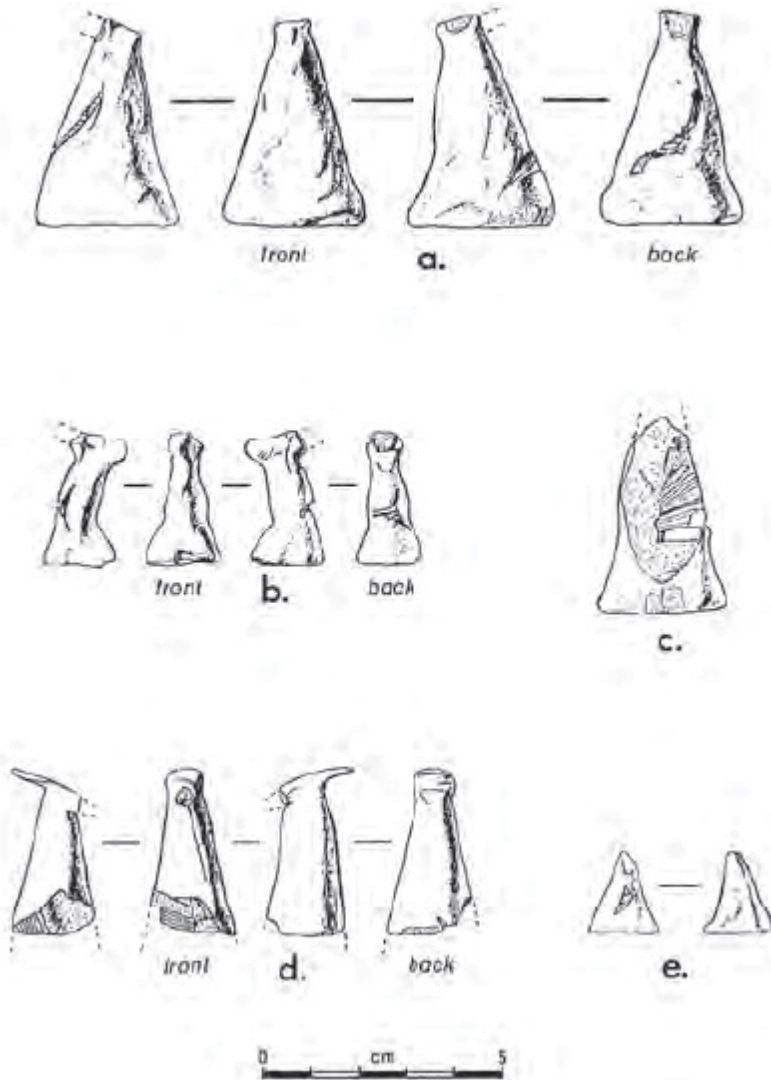


Fig.10.6 Gashed clay cones from Ganj Dareh. After Broman Morales and Smith 1990.

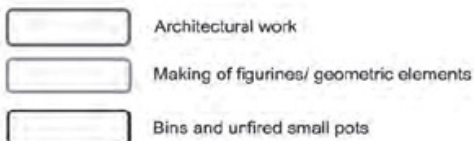
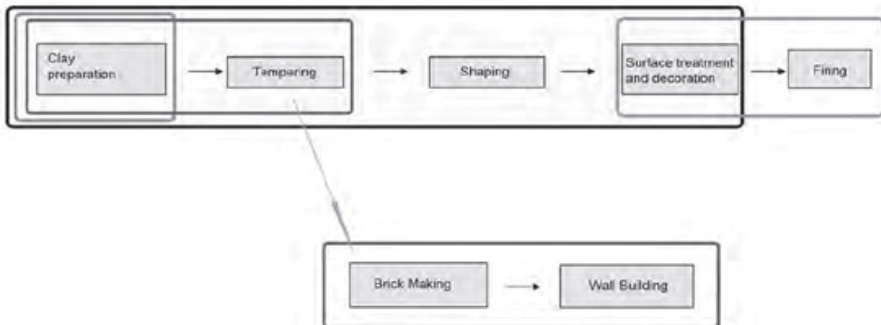


Fig.10.7 Operational chain of pottery production and the steps present at Ganj Dareh.

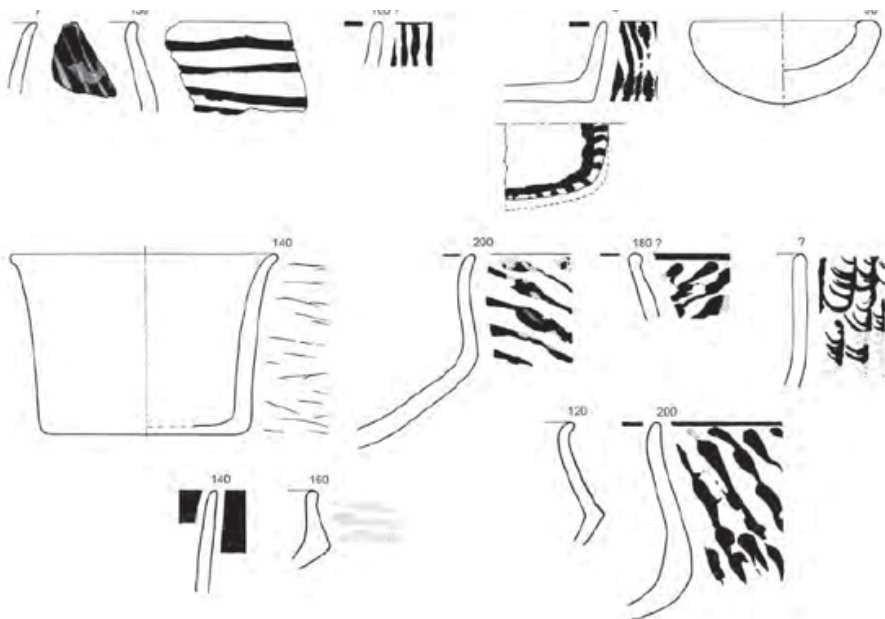


Fig.10.8 "Earlier Manifestation" pottery from Jarmo, Iraq. After Adams 1983: Figure 105.

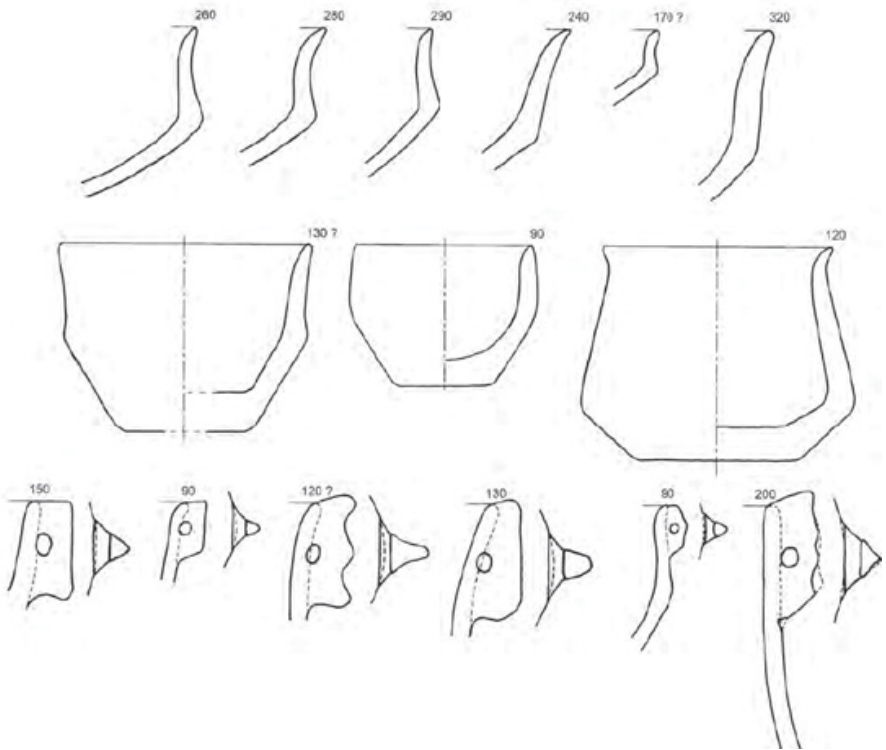


Fig.10.9 "Later Manifestation" pottery assemblage from Jarmo, Iraq. After Adams, 1983: Fig. 109.

A second observation is equally important. Even the sherds of the Later Manifestation were very unevenly spread across the site. Adams (Fig.10.11; Adams 1983: 214, Chart 3; see also Braidwood 1983: Fig. 24) notes for the largest trench, Operation II, that pottery was only present in the western parts. Even though this may be the effect of discard practices, as the excavators claim, I would argue that such a striking distribution could be the result of differential receptivity, that is, an unwillingness by some people in the community to include products of both the Earlier and Later Manifestations in their daily lives.²⁰

Third, stone vessels were partly replaced by pottery. This can be shown by comparing the development of rim diameters over time for both types of containers. While the stone bowls decrease in overall size, the ceramic vessels increase. Adams points out that stone bowls were not in their entirety replaced by pottery, but for the range of large containers only. We can conclude that hardness of containers was not of primary importance for large vessels, nor was a shiny exterior, complete impermeability or the possibility of cleaning their insides meticulously. All of these characteristics, however, could have

influenced the choice to continue the use and making of small stone bowls. There was apparently a preference for large ceramic containers to be suspended on an unknown kind of device. This is indicated by the many lug handles. It may thus be that dry items, possibly food, were stored and processed in the vessels of the Later Manifestation, but that people preferred stone bowls for small amounts, and likely for liquids.

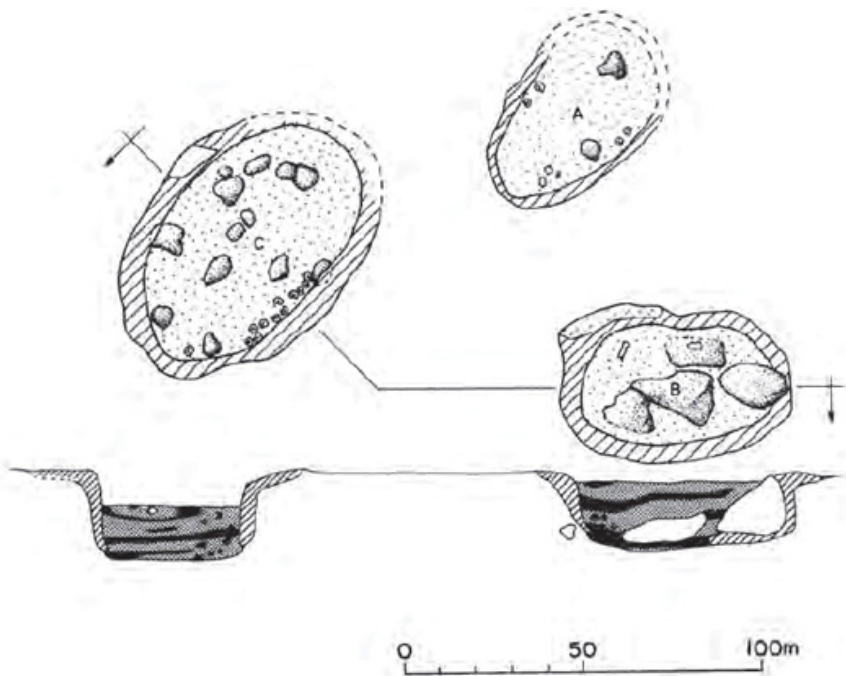


Fig.10.10 Baked clay bins from aceramic Jarmo. After Braidwood 1983: Fig. 29.

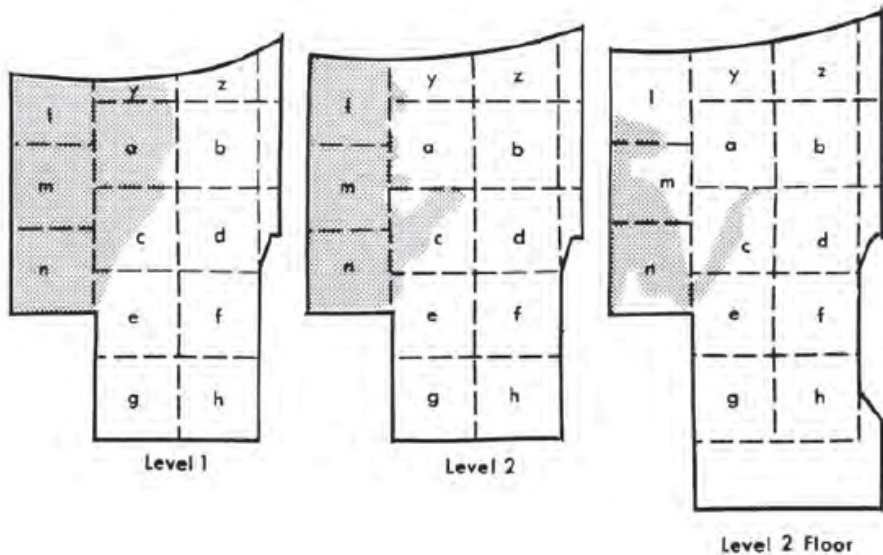


Fig.10.11 Spatial distribution of pottery at Jarmo, levels I – III. After Adams 1983: Chart 3.

The evidence from Jarmo suggests that the implementation of pottery was a long, complex process, with adoption by only some members of the community, who used it for a narrow range of particular activities only.

My initial claim that the implementation and social emplacement of an item such as pottery will be locally specific seems to be borne out by the evidence from the three sites of Tepe Guran, Ganj Dareh and Jarmo. The appearance of pottery is not necessarily due to a development of technical skills, as both knowledge and skills are present at Ganj Dareh and Jarmo for some time before pottery was made. Pottery is not necessarily adopted community-wide, and we can even identify hints at a resistance against its implementation. Pottery is used for very different purposes at the three sites. At Ganj Dareh, it remains a peripheral item all along; since all technological knowledge is present there, it is conceivable that the making of ceramic vessels was avoided rather than ‘not yet invented’. At Jarmo, small, ephemeral vessels are replaced by sturdy, coarse ones associated with handling in quotidian tasks; at Tepe Guran, the sequence shows an increasing variability of pottery. At the latter site, containers are mostly small and tend to be decorated, and it is difficult to assess their contexts of use without further information. Finally, the regional distribution of pottery may indeed have encouraged local production, but in unforeseen ways. People apparently considered the Earlier Manifestation of pottery at Jarmo an inadequate replacement for stone

bowls. However, the appearance of this pottery may have spurred the adoption of another type that may have been known already. Thus, pottery had a particular seat in life, and a changing one, at each of these three sites.

Bakhtiyari Zagros and Fars

Further east in the Bakhtiyari region of the Zagros lies the small site of Qale Rostam (Fig. 10.2), where three phases of early pottery development could be observed (Nissen and Zagarell 1976; Bernbeck 1989). The possibility of an aceramic layer at the base of the low mound needs to be further explored. Recent radiocarbon dates from the earliest (ceramic) phases III and II indicate a range of c.7050–6700 cal. BC which renders an aceramic level a distinct possibility.²¹ After a hiatus (Bernbeck 1989: 194), the late Phase I can be dated to approximately 6100–5900 cal. BC. Unfortunately, the excavations consisted of a sounding only and the extremely small surface does not contain any interpretable features. The only data at our disposal, apart from lithics (Gebel 1994), plant remains and animal bones (Daujat 2007; Daujat and Mashkour 2017) is the pottery assemblage.

Pottery develops from small, crude shapes in Phase III to larger ones in Phase II, where there are also a few red painted vessels with vague parallels to the Sarab and later Guran materials (Fig. 10.12). Phase I at Qale Rostam can be linked to the early Bashi phase in the Kur River Basin. This would mean that the sequence at Qale Rostam spans almost a millennium. The last phase I is marked by a sudden change in both shape and decoration of ceramics. While earlier pottery has mostly sinous-sided walls, round bases, and is largely undecorated, the Phase I shapes are almost all carinated, intricately painted and have dimpled bases (Fig. 10.13). These kinds of vessels were likely made from three separately constructed parts: base, body below the carination and walls above the carination. Associated with this shape is a standardized decorative structure with a red wash on the outside below the carination and on the inside below the rim, as well as dark brownish paint above the carination. The designs are extremely complex and rigidly structured (Bernbeck 1999).

While distinctly variable vessel sizes appear from the earliest Phase III on, the relatively high carinated shapes of Phase I are slowly replaced by much more shallow bowls at the very end of the sequence. Judging by sherd densities, the use of pottery in phases II and III was rare. The situation seems similar to that of layers S through D at Tepe Guran. The sharp change in pottery making between phases II and I does not necessarily imply a concomitant

change in use, as most containers continue to be small. However, the complex carinated shape may have led to greater breakability.

In the Kur River Basin and surrounding plains, the Neolithic sequence is still not well understood despite numerous surveys and excavations. So far, we have no site where a transition from an aceramic to a ceramic Neolithic could be documented. Recent work at Rahmatabad a few kilometres southwest of Pasargadae, at the convergence of the Tang-e Bolaghi and the Saadatabad valley, has revealed a long sequence of aceramic layers that consistently give dates of ca. 7050–6650 cal. BC, closely similar to the early date from Qale Rostam III (Bernbeck et al. 2008). This makes it likely that the process of implementation of pottery occurred later in Fars than at sites in the Bakhtiyari or Western Zagros ranges. However, we do not yet know precisely when the earliest pottery of the Mushki type appeared.

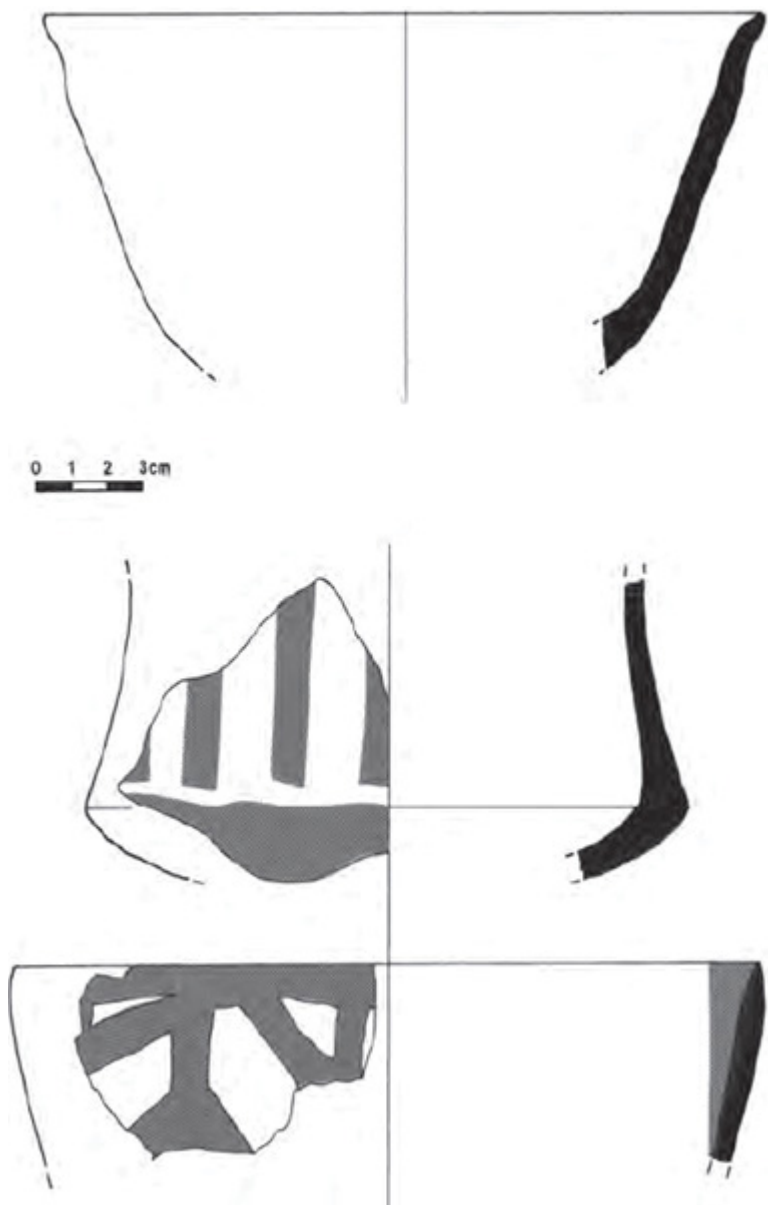


Fig.10.12 Pottery from Qale Rostam, Phase III (a); and Phase II (b, c). After Bernbeck 1989: Abb. 95b, 87g, 85b.

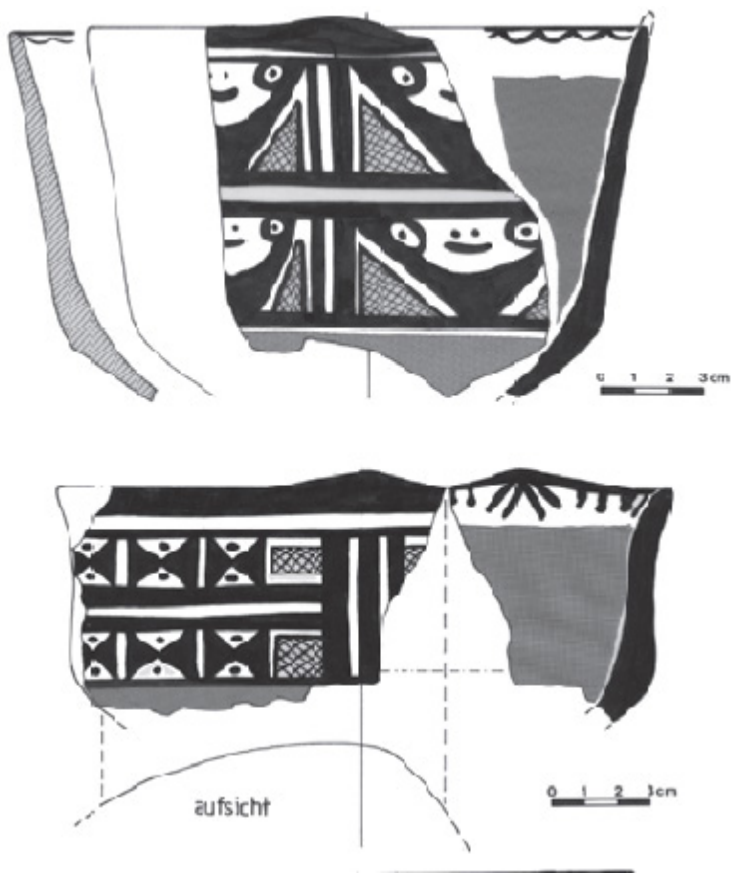


Fig.10.13 Pottery from Qale Rostam, Phase I. After Bernbeck 1989: Abb. 71a, 56 b, c.

This Mushki pottery is named after the type site of Tall-e Mushki, first published by Vanden Berghe (1952). Mushki pottery is red slipped, and the exterior surface is usually polished. Designs show a low number of variations on a basic theme that consists mainly of a network-like pattern and attached dots (Fig. 10.14; Fukai et al. 1973: 29–30; Pl. XLIX). Carinated shapes prevail, but in contrast to the Phase I shapes at Qale Rostam, the upper walls are often convex, so that the vessels are restricted. The succeeding Bashi phase in the Marv Dasht was only recently recognized as a separate chronological entity during excavations at Tol-e Bashi (Abdi et al. 2003; Pollock et al. 2010). Changes from the foregoing Mushki phase consist of the almost complete absence of red slips for painted pottery, the abandonment of the carinated shapes in favour of sinuous-walled vessels and modifications of the network-dot patterns. Pottery decoration is overall finer, denser and very carefully done. A thick, watery clay coating was applied to the vessel bodies. This surface layer was smoothed and painted, but peels off extremely easily so that many

vessels have lost the entire surface. There is no evidence that such an obvious technological weakness was mitigated by changing production procedures. Jari pottery, dating only slightly later, is of an even worse quality in terms of vessel body and surface, and is marked by a slow change in pottery design as well as form. Absolute dates do not allow a clear separation of the Bashi and Jari phases (Pollock 2010).²² However, the most interesting change in the pottery sequence occurs with the succeeding Shamsabad phase where a coarse, crumbly, thick-walled and unpainted pottery prevails. This ware is already present in Mushki through Jari contexts as a minor element, with all the same characteristics, including the open, shallow, basin-like forms. However, it occurs as the dominant type of pottery in Jari A, Level II and Bakun B, Level I (McCown's terminology; Egami and Masuda 1962: 4–5; Figs. 18 and 19).

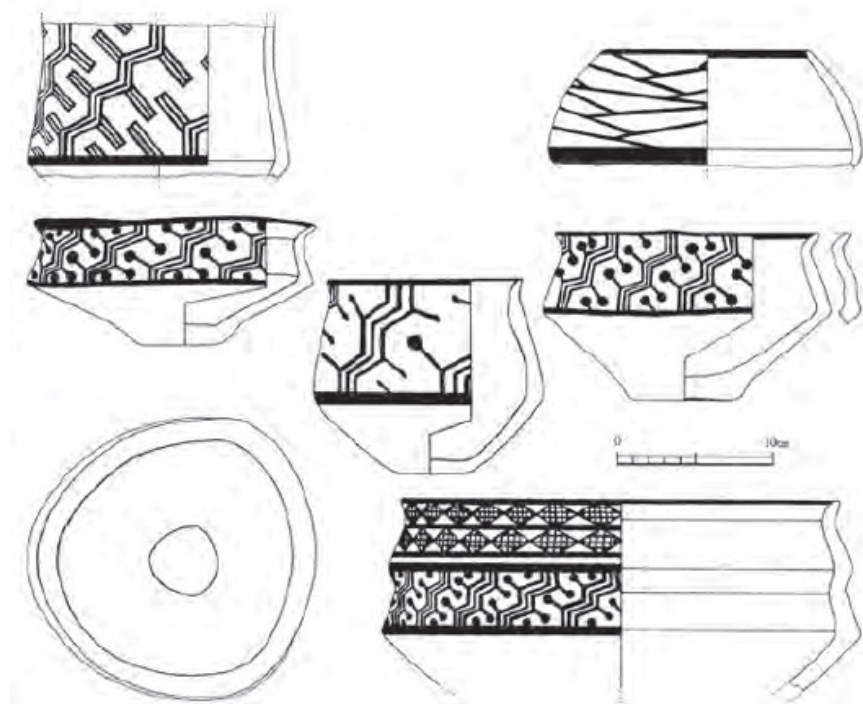


Fig.10.14 Pottery from Tall-e Mushki. After Fukai et al. 1973: Plate XLIX.

The Marv Dasht sequence is of interest in three ways. The first concerns not the past, but our archaeological discourse and its silent logic in the present. Since the discovery of ceramic Neolithic wares in the 1950s by Vanden Berghe, the Mushki-Bashi-Jari-Shamsabad sequence has had a tortuous history of interpretation. Vanden Berghe

thought that Jari was earlier than Mushki. The Japanese expedition at Tall-e Mushki and Sumner's survey work were able to reverse this sequence. More recently, Alizadeh (2005) had proposed a sequence with Shamsabad as the oldest phase and Mushki as the latest one, although he has now abandoned this idea (Alizadeh 2006: 261; Table 29). This sequence was clearly based on assumptions about an evolution of pottery technologies from 'low quality-undecorated' to 'high quality-decorated'. I do not raise this issue here to criticize colleagues – I have myself fallen prey to it (Bernbeck 1989: 311; Bernbeck et al. 2005) – but to reflect on the ways in which archaeological arguments are constructed. The lack of stratigraphic control for the sequence of early potteries in the region was bridged with an assumption that the quality of pottery ought to be low at the time of its implementation. We may falsely think that the appearance of a craft – or anything else, such as agriculture – involves undeveloped skills. That this is a problematic proposition in itself can be shown by considering the evidence from Ganj Dareh or Jarmo where all elements of the *chaîne opératoire* for pottery production were known through the making of other items, but were not fused for the making of fired containers. However, the main fault in logic does not lie in assumptions about the initial appearance of pottery, but in a silent model of unilinear evolution of craft production that dismisses the importance of the seat in life of such a class of objects. In our case, this results in the expectation that pottery technology should constantly 'improve' over time rather than respond to locally perceived needs. We have already seen that 'technological improvement logic' is contradicted by the sequence at Jarmo as well.

A second, equally important issue concerns the development of early pottery distributions in the Marv Dasht and surrounding plains. In a wide-ranging overview of the Neolithic period in Fars, Weeks et al. (2006a) point out that Mushki pottery has a much wider regional distribution than the later Bashi or Jari wares. Mushki pottery is easily identifiable and has meanwhile been found during excavations at Hajji Bahrami cave in the Tang-e Bolaghi (Tsuneki and Zeidi 2008), at Rahmatabad in the Saadatabad valley (Bernbeck et al. 2008), in Nurabad in the Mamasani region (Weeks et al. 2006b)²³ and in the Shiraz-Sarvestan area (Stein 1936). Sumner (1972) reports from his survey work that the density of sites with Jari pottery in the Marv Dasht is much higher than that of Mushki period sites. Furthermore, his research and more recent surface collections from Fars (Sumner 1977; Ikeda 1979; Alden et al. 2004; Bernbeck et al. 2005) suggest a fast diversification of pottery that might well include locally specific

chronological phases and pottery variants. On this level, we find a similarity with processes of pottery development in the western Zagros mountains: initial types of vessel are geographically widespread but occurs only rarely, whereas in an ensuing phase, pottery diversifies, becomes specific to smaller regions and its use is much more frequent.

A third important aspect of the pottery development in the south-central Zagros is its seat in life. Up to the Shamsabad phase, vessels tend to be small, fragile and are either painted or red slipped. A few of the painted containers may have reached a volume of several litres, but estimates of size differences and size categories are hard to come by from the published material.²⁴ The assemblages from the turn of the 7th to the 6th millennium cal. BC from Qale Rostam (Phase I), Tole Bashi (Bashi phase) and Jari A and B all include small amounts of thick-walled coarse vessels with shapes that are different from the painted ones. This implies that ceramic vessels were occasionally tools used in heavy chores. However, in the southern Zagros, the massive use of pottery for these purposes sets in 500 to 1000 years after the initial adoption of pottery.

Thus, I can only concur with Vitelli's assessment (1989) that pottery was not necessarily a class of items that lent itself in an obvious way for cooking and related tasks, as has been postulated in universalizing models (e.g. Arnold 1985: 128–144; Brown 1989). Rather, the importance of pottery in the south-central Zagros may initially have been located largely in the symbolic realm. This does not mean that the vessels were not used for any practical purposes but rather that the contexts in which they were handled were not those of a simple, goal-oriented activity. Vessels such as those from Qale Rostam with the striking 'smiley face' design (Bernbeck 1999), or the intricate decorations of the Mushki, Bashi and Jari styles show all the characteristics Vitelli (1989: 24) listed for Early Neolithic pottery in Greece: "highrisk shapes, elegant and showy, difficult to build and even more difficult to fire successfully". They could have been used in daily commensality; it is equally possible that their use was restricted to specific festive occasions or rituals, and I would expect that there were local particularities in how and when they were used. Some additional hints can be derived from the shapes. Most vessels were small enough to be easily handled by one person. If they served for consumption, the latter was an individual affair. However, a collective use should not be excluded either, for instance if these vessels were containers for a substance that was liquid or a pulverized concentrate such as a specific paint. Furthermore, shapes of the Mushki and Bashi

traditions in the Marv Dasht tend to be somewhat closed, whereas those from Qale Rostam with their concave walls are more open. Spilling of vessel contents may have been of a greater concern for communities in the Marv Dasht than the Bakhtiari Zagros. The reason for this may be sought in the (unknown) contents of the vessels. In the Jari phase as well as at the very end of the sequence at Qale Rostam (Phase 0, Bernbeck 1989: 196), shallow open bowl shapes develop which suggest a major change in the use of ceramic containers.

The south-central Zagros region provides a fascinating, albeit incomplete picture of the implementation of pottery. I have traced the development of ceramic vessels further through time in order to show that unexpected changes in the seat of life occur even long after the appropriation of a new kind of material and associated technologies. However, due to the complexity of the basic chronological development, but also due to the lack of large-scale excavations, new research is likely to significantly change what we seem to know today.

Conclusion

In my reflections at the beginning of this paper, I mentioned four issues that I consider important for any study of the ‘invention’/‘adoption’ of pottery and Merging Clay and Fire: Earliest Evidence from the Zagros Mountains other new material items. The first is a close analysis of social emplacement as a process rather than an event. Even if the conference leads to the understanding that pottery appears shortly before or after 7,000 cal. BC across a wide range of region, from Çatalhöyük to the Northern Levant to the Zagros mountains and the Susiana plain,²⁵ this coevalness of change should not be constructed as part of the Neolithic package that moves humanity along on a *longue durée* scale from the material metaphor of “instruments” to that of “containers” (Gamble 2007: 157–204). Rather, my contribution emphasizes the locally distinct processes of (non-)appropriation of pottery in the Zagros mountains. The discussions around the emergence of pottery in Western Asia at the Tsukuba conference mirror present disputes over Neolithization: “The challenge for anyone interested in developing a satisfactory explanation of agricultural origins is to avoid the easy emphasis on broad-brush single – or even multiple – macrofactor accounts that ... do not explain much about how the transition unfolded in any particular case” (Zeder and Smith 2009: 688). The appearance of pottery is equally specific to the social conditions at each place.

One of the under-researched elements of the spread of new

technologies is its differential receptivity. Data for a detailed investigation of such issues are hard to come by with present standards of both excavation and publication. Precise density measures of artefact classes would get us a long way in the assessment of this issue. Furthermore, the spatial plotting of such density data would be key to assess intra-site differential receptivity and reasons for it (Pollock 1999). Among the sites discussed here, Jarmo is the only one to provide coarse-grained indications for this aspect of a spread of a new object class. Analysis alone, however, will not provide us with a good understanding of receptivity towards changes: we remain all too often 'scholastic epistemocentrics' who look backwards and find it obvious that pottery is a useful category of objects, instead of trying to tack back and forth between an outsider's (present) and an insider's (past) position, as advocated so forcefully by Bourdieu (2000). We need to take into account the 'non-obviousness' of a new class of items and potential objections to it. We should imagine this as taking the form of *Eigensinn*, a disposition that writer Hermann Hesse (1986) and historian Alf Lüdtke (1993) describe as subversive and at the same time merrily obstructionist, a gleeful attitude towards social or political phenomena. Such resistances can only be identified through the adoption of intricate methods of documenting the intensity with which items were used in past contexts.

A third element in my discussion is what I call the seat in life of a newly implemented item class. I prefer this concept over the reductionist term 'function', as the latter has a ring of modern instrumentality and a starkly fragmented world with a strict link between specific situations and rigidly fixed expectations of appropriate practices. While I have suggested that the seat in life of the Jarmo Later Manifestation and the Shamsabad ware were connected to daily chores, and that other assemblages were rather linked to a sphere of quotidian or festive rituals these interpretations are mere inferences. We have today enough methods to put such interpretations on much firmer ground. Skibo's (1992) excellent handbook on pottery use-wear and attrition analysis gives us the analytical tools to empirically verify the role of pottery in the lives of Neolithic communities in the Zagros. Undoubtedly, the characterization of the seat in life of a pottery assemblage would contain many more facets than I have been able to extricate from available data here. But this is not yet standard documentary procedure in analyses and publications of excavations. Similarly, refitting studies would be of import for estimates of vessel volumes and size classes, but especially for an assessment of the diachronic

development of breakage patterns.

Finally, the outcome of the implementation of pottery or any new object class is a reshaping of collective subjectivities. The widespread use of pottery, in whatever circumstances, requires a specific embodiment. Carrying a heavy jug of water on the head, retrieving a hot cooking pot without handles from a fire, even drinking out of a small ceramic beaker all presume a readjustment of the body towards its material environment. How did a new, specific, and subtle dexterity and adroitness develop in those who handled fragile pots? Pottery relates to the human body not only in conceptual terms, as has often been remarked;²⁶ the relation also literally produces new social bodies (Joyce 2005).

So far, we have no real clue about the duration of such a change in embodiment, and what its further consequences are. Even if wooden containers with shapes similar to early pottery were available at the time of the latter's introduction, they had a different specific weight, they were prone to destruction by fire, but they were also less susceptible to breakage. It is this latter point that warrants further reflections. Traditionally, pottery is referred to as a particularly sturdy class of objects. Harry and Frink (2009: 330) insist on the "rather obvious advantages of pottery – in particular, its durability compared to other containers". But is this really the case? To take a daily life situation: who has not been embarrassed by breaking a plate, cup or other dish in someone else's household? Such an event is notable because repair of the item is normally difficult or even impossible. I contend that the simple fact that pottery breaks easily is vastly underestimated in its effects on Neolithic communities. Wherever there are reliable data on Neolithic vessel density and the frequency of production (e.g. Vitelli 1989: 21–22; Bernbeck 2010), we find that production episodes were extremely rare and that the number of vessels in use was low. Therefore, breakage was surely an important issue. There are several possible strategies to avoid it. One would be to limit the number of people in a community who had the right to handle pots. Such an unlikely scenario could conceivably be attested in the Jarmo Earlier Manifestation. Another solution is to increase the scale of production, an effect that seems to occur much later in Chalcolithic times across large swaths of Western Asia. A third possibility is to develop mending technologies. These occur in some parts of Western Asia, for example in the Deh Luran plain.²⁷ However, I have not been able to spot any mending in the Neolithic pottery from the south-central Zagros that I have analyzed.

The prevalent answer to the breakage problem, however, is the

emergence of an attitude of care. Contexts in which pottery was employed may have been characterized by a comparatively heightened state of bodily restraint, by a conscious effort at carefulness, finesse and control of one's motor movements. The effects of the object class pottery on embodiment are two-dimensional. On the one hand, containers are enabling devices for the human body, mobilized in acts of collecting liquid or dry matter, transporting, storing or distributing it. At the same time, they constrain the human body in its movement because of their 'need' to be treated carefully. The resulting bodily self-limitation implies an internal disciplining. It involves a fundamental change of bodily dispositions in specific situations where vessels were used. Not only was a new kind of care required, but people had to learn in addition to switch from a 'normality' of a somewhat less careful comportment to a state of exceptional alertness and back. The result was a separation of daily life into different kinds of hexis that added significantly to the complexity of social life and changed practical consciousness. Disciplining, a pervasive trait of modern 'arts' of governing, is not only imposed by the state (Foucault 1979). In non-hierarchical societies, it may be set in motion by the introduction of a new category of material culture. Neolithic peoples of Western Asia subjected nature to their goals by shaping it into a host of new kinds of things. These things, in turn, shaped new subjectivities.

Notes

1. This paper is part of an ongoing project on the 'Spatial Effects of Technological Innovations and Changing Ways of Life' within the framework of the excellence cluster TOPOI at the Freie Universität Berlin. I thank Susan Pollock for creative discussions and critique, as well as all the participants in the Tsukuba symposium for multiple suggestions. Thanks go to Jana Eger for preparing the figures and Clement de Wroblewsky for providing a congenial atmosphere for work.
2. The Zagros mountains were once thought to be the centre of the invention of pottery when political circumstances favoured archaeological fieldwork in Iran and Iraq (Braidwood and Howe 1960).
3. I mean this as an across-the-board statement for all innovations. As Watson and Kennedy (1991) argue convincingly, archaeologists have all too often argued for differential creativity based on gender.
4. A recent example of this discourse is the public presentation of the site of Göbekli Tepe, which has been rated as a "millenarian discovery" in the title of a film made by German state-run TV. Multiple other popular articles about this site also evoke its uniqueness with its presumed "first temples" (e.g. Scham 2008).
5. Hayden argues for the emergence of pots in competitive feasting rituals, while Brown sees in them the result of new needs of Neolithic societies to process food from domesticated plants or animals. Skibo and Blinman add that gathering-hunting societies may use early pottery for processing food as well.
6. Theologian Herrmann Gunkel, who originally coined the term "Sitz im Leben", used it to denote the social contextualization in which Biblical texts were to be located (Wagner 1996).

7. Bourdieu employs a notoriously and intentionally unsharp terminology. *Habitus* and *hexis* are closely related terms, *Merging Clay and Fire: Earliest Evidence from the Zagros Mountains* but while the former denotes a deep structure of generative force, the latter is relegated to a more superficial bodily relation. It is “a posture, a way of bearing the body, a durable way of being of the durably modified body which is engendered and perpetuated, while constantly changing (within limits), in a twofold relationship, structured and structuring, to the environment” (Bourdieu 2000: 144).
8. This does not necessarily mean that its technology of production was also adopted.
9. The particular change from aceramic to ceramic contexts is heavily overemphasized and overestimated by archaeologists. The reason is a focus on chronology, where the appearance of a previously non-existent and archaeologically easily recognized type is a convenient and therefore problematic construction point not just for synchronicity, but for interpretive coevalness. The search for similarities across a perceived divide between a ‘pre-pottery Neolithic’ and a ‘pottery Neolithic’ is extremely rare, but is taken for granted within these two time periods.
10. This is important, but it is misconceived when such variables are treated as if they existed theoretically in a multidimensional space where potentially any variable state could be associated with any other. This approach follows formal logic rather than cultural ways of making items, where specific variables such as thick walls, specific shapes or temper were combined in order to produce vessels suitable for a range of daily tasks.
11. These studies are highly valuable but have a problematic universalizing tendency. They try too much to identify the use of vessels by applying an instrumentalist logic derived from experiments in a laboratory. The claim that specific tempers are better than others for a vessel for heating is mobilized to produce standardized expectations that all vessels with such characteristics were potentially used over a fire. It is important to keep in mind that people in the past were working within their own worlds, and that the instrumentalism that underlies Skibo’s arguments is a straightforward and simplifying generalization of the ‘lab situation’ (Schiffer and Skibo 1987) to radically different social contexts of practice. Scientific research is, as Latour (1993) shows so convincingly, a cultural activity and not a truth generator.
12. It should be clear that I do not expect to find one and only one typical social location for the use of pottery in ancient or more recent social contexts. For pottery, a primary period of convergence towards a specific sphere of use is in many places followed by a diversification. However, Jomon pottery seems to be a case of an unusually long-lasting, stable seat in life of this class of items.
13. The discussion does not include the evidence from Tepe Abudl Hosein (Pullar 1990) as the stratigraphic transition of aceramic to ceramic layers is highly problematic. The radiocarbon dates also span such a wide range that dating single layers and equating them with other sites remains basically impossible.
14. Apparently, the aceramic levels of Tepe Guran included a similar sherd (Mortensen, pers. comm. 1987).
15. The use of these containers is quite similar to the storage clay bins from Tell el Kerkh (Odaka, this volume).
16. Ingold (2008) has recently reiterated the importance of matter and its properties in archaeological interpretation.
17. This is not a mere matter of phrasing: play with a medium such as clay means that the medium itself is at the centre – one might say that means and ends coincide – whereas a search implies that the qualities of clay are a means toward an ulterior goal. Smith (1990: 333) himself describes this well when he remarks about the architecture that “the rules were not yet tightly defined or codified, and the tangible results often puzzle us. There seems ... to be much ad hoc reasoning”.
18. In the analysis of pottery production, it is useful to distinguish necessary from optional steps, where mixing with water, shaping and firing are the three main necessary ones (Bernbeck 2010).
19. It is worth quoting his insightful interpretation at some length: “The technique of manufacture that was utilized when large-scale production began was simpler and cruder than the techniques used for the earlier vessels. The people of Jarmo seem to have rejected many aspects of the pottery vessel industry as it was introduced to them and to have utilized instead inferior methods that in some way may have represented less of a

- departure from their prevailing level of handling clay in making other types of artifacts" (Adams 1983: 223).
20. Neolithic agriculture and herding in the Zagros region display a similar unevenness in spread and development (Bernbeck 2001).
 21. I thank Marjan Mashkour and Julie Daujat for providing me with this information.
 22. The stratigraphic position of Jari pottery at Tol-e Bashi is clearly above the Bashi phase (Pollock 2010).
 23. The Mushki pottery from the Mamasani region lacks the characteristic red slip.
 24. Adams' analysis (1983) is a valuable exception.
 25. As Stuart Campbell explains (this volume), the appearance of synchronicity across a huge geographic region may in part be due to the plateau in the radiocarbon calibration curve in the time range from c.7000 cal. BC to 6850 cal. BC.
 26. Archaeological language is reminiscent of this. We talk of body sherds, the necks of jars, their lips and belly, shoulders, etc.
 27. Frank Hole allowed me to inspect his collections from Chagha Sefid and Ali Kosh. Mending holes occur on many of the sherds from these sites.

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Chapter 11

The Emergence of Pottery in Northeast Iran: The Case Study of Tappeh Sang-e Chakhmaq

Akira Tsuneki

Introduction

Northeast Iran has been considered a peripheral area for Neolithisation. The transformation from hunter-gatherer to early farming societies had been achieved through influence from regions to the west, probably the Northern Levant and Zagros (e.g. Harris 1998: 78; Weeks 2013: 67). We have no evidence of early farming settlements in this region. Instead of early Pre-Pottery Neolithic tappeh settlements, several caves and rock shelters with cultural sequences from the early Holocene were discovered and excavated in Northeast Iran. Classic examples include Gar-i Kamarband (Belt Cave), Hotu, and Ali Tappeh caves (Coon 1951, 1952, 1957: 129–204; Dupree 1952; McBurney 1964, 1968) south of the Caspian Sea (Fig. 11.1).

The earliest pottery in Northeast Iran was discovered from such caves and was called “Caspian Neolithic Soft Ware” (Dyson 2011). This type belongs to a coarse chaff-tempered pottery, called “soft-ware”, and the cultural layers that yielded it are called “soft ware horizons” (Dyson 1965). C.S. Coon, the excavator of Gar-i Kamarband (Belt Cave) and Hotu Cave, asserted that he had discovered soft ware sherds in the Neolithic layers. A relatively small number of soft ware sherds ($N = 33$) was discovered in the Gar-i Kamarband Neolithic layers with pottery (levels 4–7), though similar sherds were found in upper layers that were mixed with later materials (Coon 1951: 77–78; see also Gregg and Thornton 2012). In addition, a “fine red ware” sherd (“hard sherd” in Coon’s classification) was discovered from level 12 (Late Mesolithic) and a soft ware sherd was discovered from level 10 (early Neolithic) at Gar-i Kamarband but Coon thought these sherds were intrusive from the upper layers (ibid). Four sherds from Gar-i Kamarband were studied in detail by Matson (1951: 93–95). Three of them are soft ware and their fundamental characteristics are as follows. Their surfaces are dark, light orange-tan and chocolate brown colored, having been roughly burnished, chaff-tempered and made with a relatively fine-textured paste.

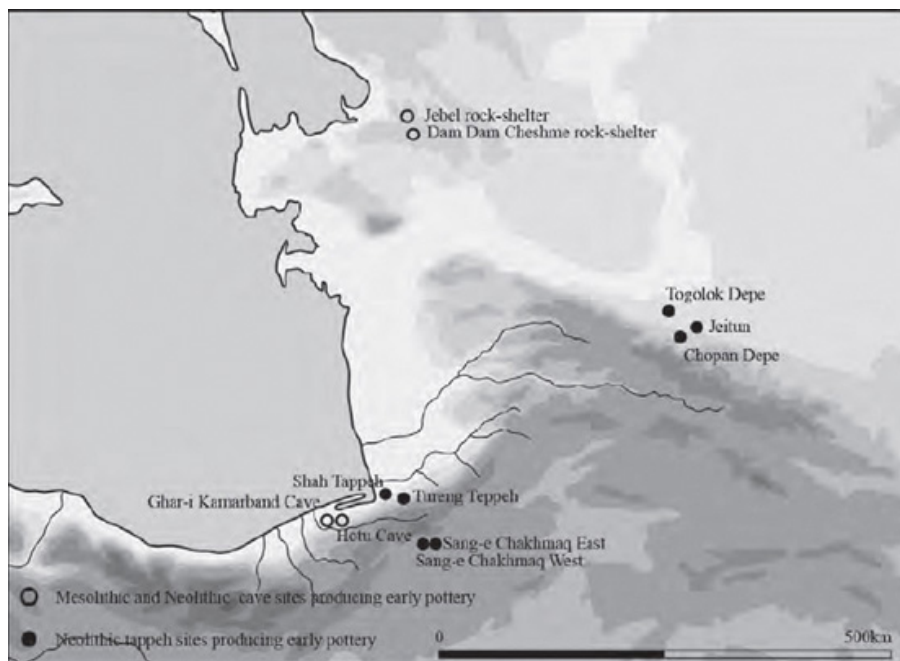


Fig.11.1 Distribution of prehistoric sites with earliest pottery in northeastern Iran and southern Turkmenistan.

Assessment of the soft ware is difficult and many questions remain unanswered. For example, are the sherds found at Gar-i Kamarband and Hotu Cave the earliest pottery in Northeast Iran? Do only cave sites contain aceramic and early pottery Neolithic layers? Why did the cave dwellers initially produce pottery in Northeast Iran? Were the sherds discovered below the Neolithic layers actually intrusive? These were discovered just above the ‘pre-ceramic Neolithic’ and ‘Late Mesolithic’ layers at Gar-i Kamarband, and absolute dates of the earliest level of aceramic Neolithic and Mesolithic layers are c.7550 cal. BC and 11450 cal. BC (Harris and Coolidge 2010: 56) respectively. The ‘Mesolithic’ occupation at Hotu Cave dates from c.10850 cal. BC to 6950 cal. BC (ibid). Without concrete evidence for domesticated plants and animals, we believe that the cultural layers just before the appearance of pottery must have been deposited by hunter-gatherers who occupied the caves. As mentioned above, some sherds were nonetheless discovered in these layers.

The Sub-Neolithic and Soft Ware Neolithic periods defined by Coon (1957: 208) must date to the 7th millennium cal. BC. We can confirm that the soft wares were used by local hunter-gatherers or pastoralists living in the caves. It is possible that this pottery had been imported from farmers living in tappeh settlements at the same time. Up to now, we have no solid evidence to refine the age estimates for these

sherds in Northeast Iran and no exact date for the soft ware horizons there. Therefore, in order to discuss the emergence of pottery in Northwest Iran, we must consider the excavated materials from early tappeh settlements in the region.

Until recently, few excavations were conducted at the Neolithic tappehs in Northeast Iran. Several Neolithic remains, including sherds, were recovered from the bottom of excavation trenches at Yarim Tepe (Crawford 1963, Stronach 1972) and Tureng Tepe (Deshayes 1970) in the Gorgan Plain in the 1950s and 1960s. The excavators of these sites noticed that the earliest pottery was similar to the Jeitun pottery in southern Turkmenistan. More recently, Iranian archaeologists surveyed the Gorgan Plain and an area south of the Caspian Sea lowland, and found Neolithic materials on the surface of Tugh Tepe near Behshahr and Armadlu Tepe in Golestan National Park (Coolidge 2010: 62–63). At Aq Tape on the Gorgan Plain, the cultural layers producing the pottery similar to those of east tappeh of Sang-e Chakhmaq were excavated by Shahmirzadi and Noukandi (2001). The archaeologists Revzani and Roustaei also investigated other tappeh settlements, such as Deh Keir Tepe, Kalate Khan and Tappeh Sang-e Chakhmaq, located in the Shahrud region (Azarnoush and Helwing 2005: 199, Coolidge 2010: 51, Roustaei et al. 2015). Since most of these sites yielded early Jeitun type pottery, we can suppose that tappeh settlements appeared before the early Jeitun period (6200–5800 cal. BC, Harris, Gosden and Meadows 2010). Unfortunately, most of these investigations were surveys or trial excavations. Until recently, no comprehensive excavations like those conducted by the Japanese at Tappeh Sang-e Chakhmaq in the 1970s have been carried out in this region.

Tappeh Sang-e Chakhmaq

Tappeh Sang-e Chakhmaq is a Neolithic tappeh settlement located on the northern edge of the village of Bastam, 8 km north of Shahrud. The site was excavated in the 1970s by a team from the Tokyo University of Education (predecessor of the University of Tsukuba) under the direction of the late Professor Sei-ichi Masuda. These excavations *The Emergence of Pottery in Northeast Iran: The Case Study of Tappeh Sang-e Chakhmaq* discovered the remains of an early farming village that provided a great deal of insight on the Neolithisation of northeastern Iran. However, results from the excavations have only been partly published in preliminary form (Masuda 1972, 1974a, 1974b, 1976, 1977, 1984, Masuda et al. 1977, 2013). Therefore, the site's importance is not yet fully understood.

Since some excavated materials were transported to Japan and are currently stored at the University of Tsukuba, I can now discuss the early pottery from Sang-e Chakhmaq that is included in these assemblages.

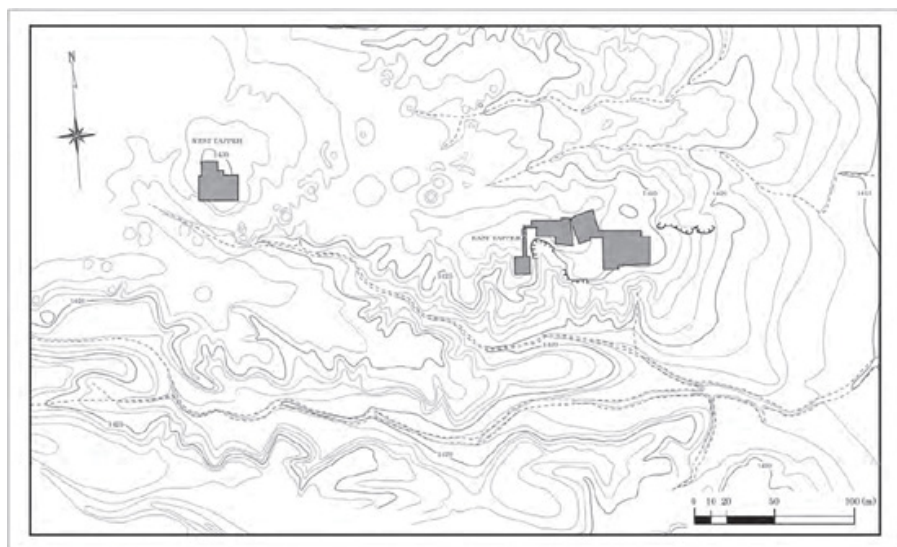


Fig.11.2 Tappeh Sang-e Chakhmaq topographical map.

The site consists of two tappehs situated c.200 m apart. The west tappeh is c.50 m in diameter and c.3 m in height. The east tappeh has an irregular plan and is much larger than the west tappeh, with a height of c.6 m (Fig. 11.2). Five construction layers in the west tappeh and six in the east tappeh were exposed, all of which belong to the Neolithic period. Because the west tappeh yielded only a few pottery sherds, it has been considered an aceramic Neolithic settlement (e.g. Weeks 2013: 56). On the other hand, all occupation layers of the east tappeh yielded abundant pottery, comparable with the early and middle Jeitun periods. Based on the finds, it is quite certain that the uppermost layer I of the west tappeh is older than the lowest layer VI of the east tappeh, but it is unclear whether there was a hiatus between the two tappehs.

New AMS dates

Although Masuda (1972, 1974a) already published three radiocarbon dates for both tappehs, they were measured by the traditional method that counted beta particles. Therefore, I took new samples of carbonized wood and animal bone stored in the University of Tsukuba and submitted them to the Center for Chronological Research at

Nagoya University for AMS ^{14}C dating. Thanks to Prof. Nakamura and Dr. Minami at the Center, we have obtained thirty-seven dates (Fig. 11.3). The samples cover from the lowest layer of the west tappeh to the uppermost two layers of the east tappeh.

All of the AMS ^{14}C charcoal dates from layers V–II of west tappeh fall between 8052 ± 31 BP and 7900 ± 30 BP. These dates give a 1-sigma calculated range of c.7100–6650 cal. BC. Unfortunately, we do not have charcoal samples belonging to layer I of the west tappeh. Two charcoal AMS radiocarbon samples from layer V of the east tappeh date to 7412 ± 30 BP and 7194 ± 31 BP, giving 1-sigma calculated ranges of c.6400–6250 cal. BC and c.6100–6000 cal. BC. The dates of three charcoal samples from layer II of the east tappeh are 6916 ± 31 BP, 6921 ± 27 BP, and 7023 ± 29 BP. These indicate that the nearly last occupation phase of Chakhmaq dates to c.6000–5700 cal. BC. Just one charcoal sample from the latest east tappeh, layer I, dates to 6258 ± 30 BP. This date is much later than the dates of layer II. If it is accurate, the occupation of Chakhmaq ended around 5250 cal. BC.

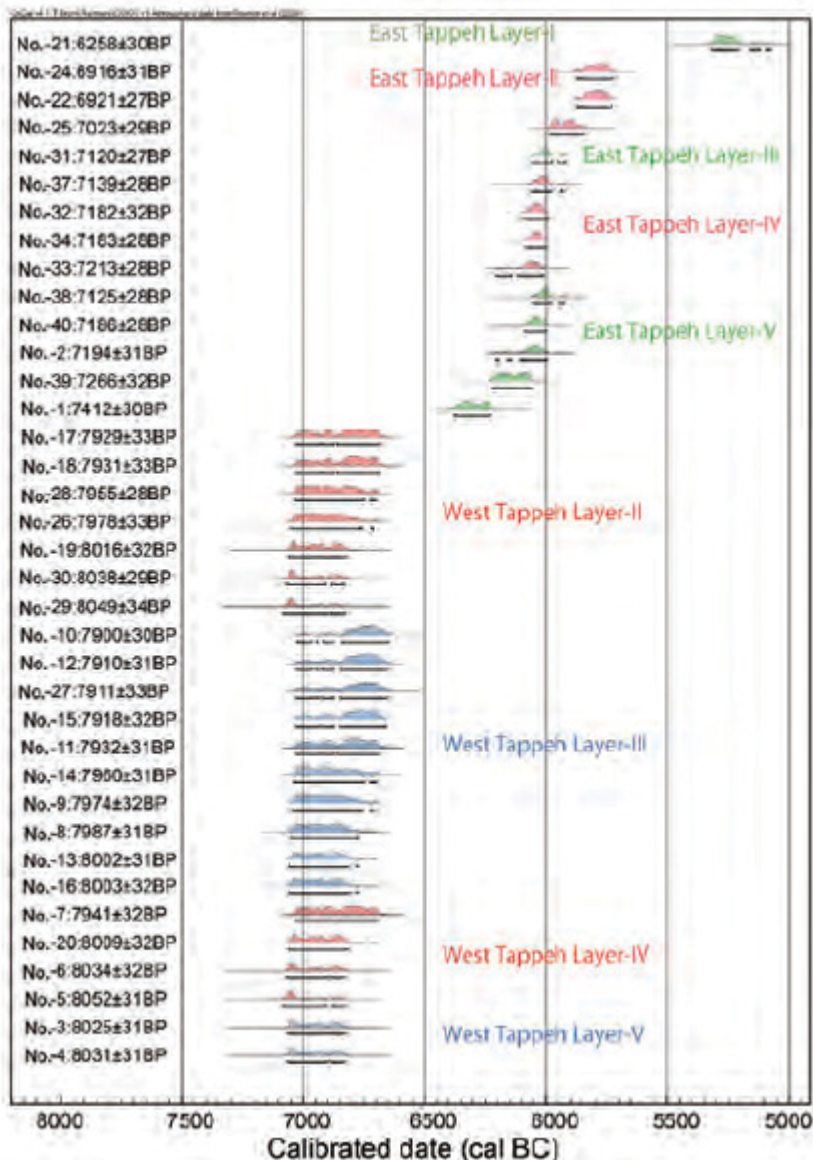


Fig.11.3 AMS ^{14}C dates (Nakamura and Minami pers. comm.).

Therefore, we can preliminarily state that the west tappeh settlement began at the end of the 8th millennium cal. BC and continued until the early 7th millennium cal. BC. On the other hand, occupation of the east tappeh likely began in the late 7th millennium cal. BC and ended around the middle of the 6th millennium cal. BC (Fig. 11.4).

Structures

Before discussing the pottery, I will summarize the building structures of both tappehs. Those discovered in all layers of the west tappeh had clearly defined forms, all of which consisted of a single room rectangular house measuring $6 \times 3\text{--}4$ m (Fig. 11.5). The interiors of each building were carefully treated with gypsum plaster. In addition, each one was divided into several different levels, including a square-shaped hearth on the northern side. A small square area with a hearth and a rectangular portion in the southern section appear to have had floors elevated one step higher. These single room houses usually stood alone but in some cases, they were joined with another similar house or courtyard.

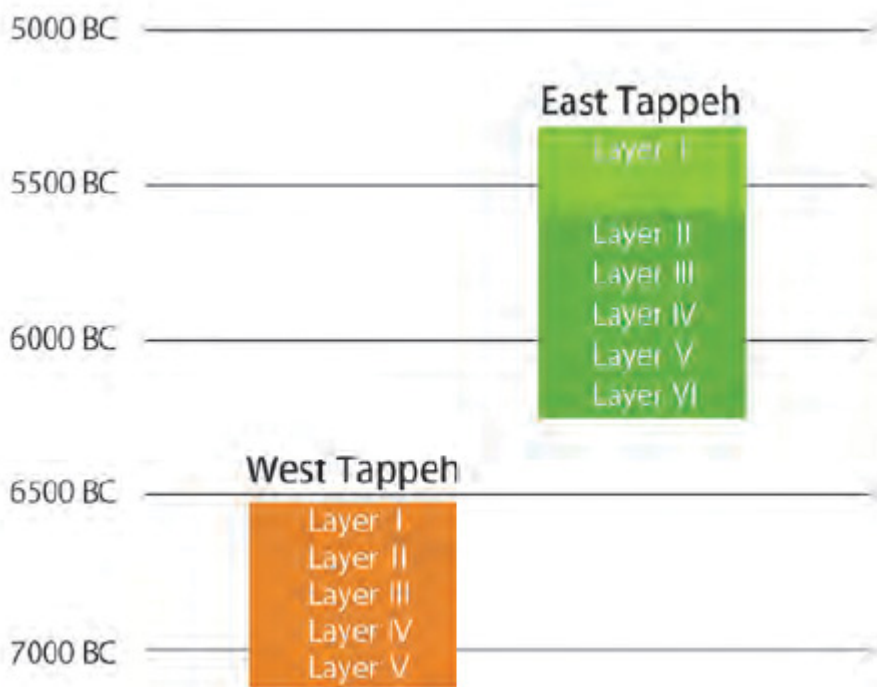


Fig.11.4 Suggested dates for Tappeh Sang-e Chakhmaq.

The building structures from the east tappeh consisted of various forms. In layers V to III, we found multi-room rectangular houses ranging in size. The most basic house was rectangular and had multiple rooms measuring $c.5 \times 8$ m, with an annex or a courtyard equipped with kilns (Fig. 11.6). Unlike the west tappeh, meticulous gypsum plastering was not observed on the walls and floors of these houses. Distinctive cigar-shaped mud bricks were used as building materials. A large number of kilns were discovered in the open space

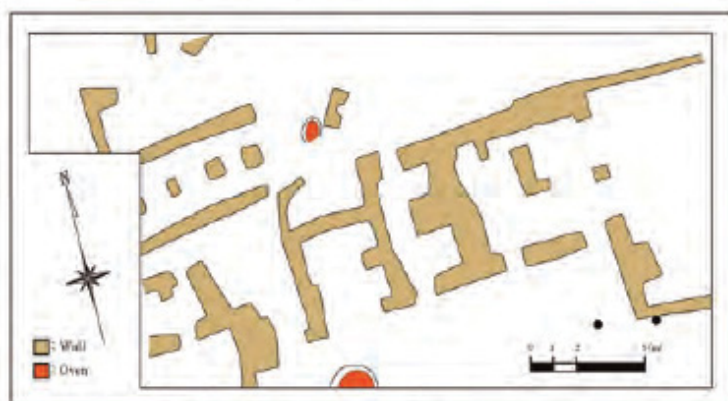
in layer III. In the uppermost layers I-II, different types of buildings were found, characterized by square-shaped rooms with hearths on their northern sides. Primary rooms were not divided into minor rooms, but small rectangular rooms were attached instead.



Fig.11.5 Buildings of the west tappeh.



Layer IV, main trench, east tappeh



Layer V, main trench, east tappeh

Fig.11.6 Buildings of layers 4 and 5 of the east tappeh.

Pottery from the west tappeh

All layers of the east tappeh produced a large amount of pottery, leaving little doubt that it played important roles in human societies. In contrast, no potsherds were discovered during the first season of excavations at the west tappeh, despite the relatively large excavation area. Therefore, the excavators believed that the west tappeh of Sang-e Chakhmaq was the first Pre-Pottery Neolithic settlement discovered on the Iranian Plateau. However, when they dug down into layer III of the west tappeh in 1973, they recovered a few small potsherds that were initially thought to be intrusive.

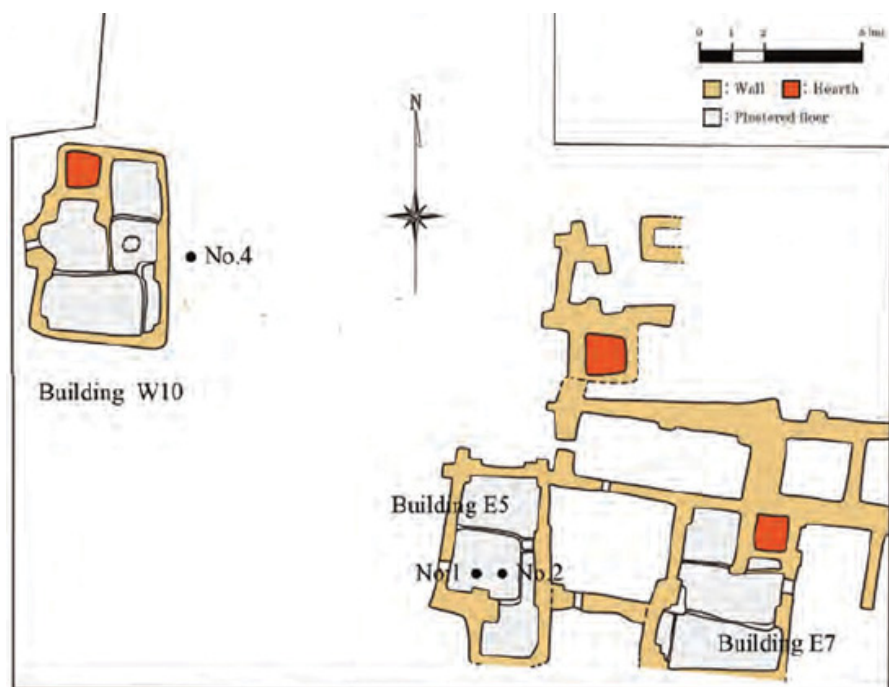
It is not clear how many potsherds were discovered during the west

tappah excavations, but their number is thought to be no more than a dozen. Only four potsherds are currently stored at University of Tsukuba, all of which were discovered in layer III of the west tappah. These are introduced individually below (Figs.11.7, 11.8).

1) This small rim sherd measures 21×15 mm, with a thickness of 5 mm. The orange-colored paste contains a small amount of chaff temper. Both the outer and inner surfaces were red-washed and highly burnished, resulting in a lustrous finish. This piece was discovered between the gypsum floor plastering of Building E7.

2) This small body sherd measures 30×15 mm, with a thickness of 9 mm. The paste is orange with chaff temper. Like the first piece, both outer and inner surfaces were red-washed and highly burnished. The piece was discovered in the fill of Building E5.

3) This represents the largest fragment, measuring 40×35 mm, with a thickness of 10 mm. The brown paste contained chaff and some black sand temper. Only the outer surface was red-washed and burnished, while the inner surface was unwashed and left smooth. The provenience of this piece is unknown. However, one of the 1973 excavators, Mr. Setsuo Furusato, kindly told me that he found one sherd inside the mud brick of one building in layer III. Since this piece lacks any contextual information other than it came from layer III, it was probably discovered from this context.



4) This is a small but thick piece, measuring 25×15 mm and 13 mm thick. The paste is dark brown and contains some black sand temper. Both surfaces are dark brown but unwashed and burnished. This piece was discovered outside and just west of Building W10.

If the find location of sherd No. 3 is correct, all four small pieces were discovered in association with buildings in layer III of the west tappeh. In particular, sherd No. 1 was discovered between the superimposed gypsum floors and No. 3 was probably discovered inside a mud brick. It is unlikely that any of these finds were intrusive.

Three potsherds share common characteristics. They have reddish-brown, chaff-tempered paste, with burnished and red-washed surfaces. No. 4 is not red-washed or chaff-tempered, but it has burnished, dark-colored surfaces. Therefore, these were not coarse, plain pottery but instead were decorated with red-wash and/or burnishing. It should be noted that all sherds are small, measuring a maximum of 45×35 mm.

Some sherds discovered in layer VI of the east tappeh have some similar attributes to those found in the west tappeh. However, not all attributes are the same; for example, the red wash on east tappeh sherds resembles a true painted design compared to west tappeh potsherds.

It is debatable whether the west tappeh represents settlements belonging to the Pre-Pottery Neolithic or Pottery Neolithic. The absolute age of level III of the west tappeh falls in the early 7th millennium cal. BC, and the stable production of pottery had already appeared in other regions such as the Zagros and Northern Levant by this time (this volume). However, the Sang-e Chakhmaq potsherds were quite different from those of ceramics in the phase of stable production. They are quite limited in number and only small fragments were discovered. Based on these factors, we would argue that pottery was not used for practical purposes in the Neolithic settlement of the west tappeh at Sang-e Chakhmaq. In this way, the Sang-e Chakhmaq west tappeh pot sherds are very similar to those of initial potteries in the Pre-Pottery Neolithic (see [Chapter 1](#)).

Pottery of the east tappeh

All layers of the east tappeh (from the lowest layer VI to the uppermost layer I) yielded a large amount of pottery. It is clear that pottery was essential to the social lives of Neolithic people who occupied the east tappeh. Three pottery types were recognized here:

painted, plain and thin black-burnished. However, the number of thin-black burnished pottery was quite limited and the east tappeh assemblage primarily consists of painted and plain pottery. Compared to the painted type, the number and variety of plain The Emergence of Pottery in Northeast Iran: The Case Study of Tappeh Sang-e Chakhmaq pottery were limited. The painted pottery type was most abundant and can be divided into two main groups, 1 and 2.



Fig.11.8 Four potsherds from layer III, west tappeh. Upper: outer surfaces; lower: inner surfaces.

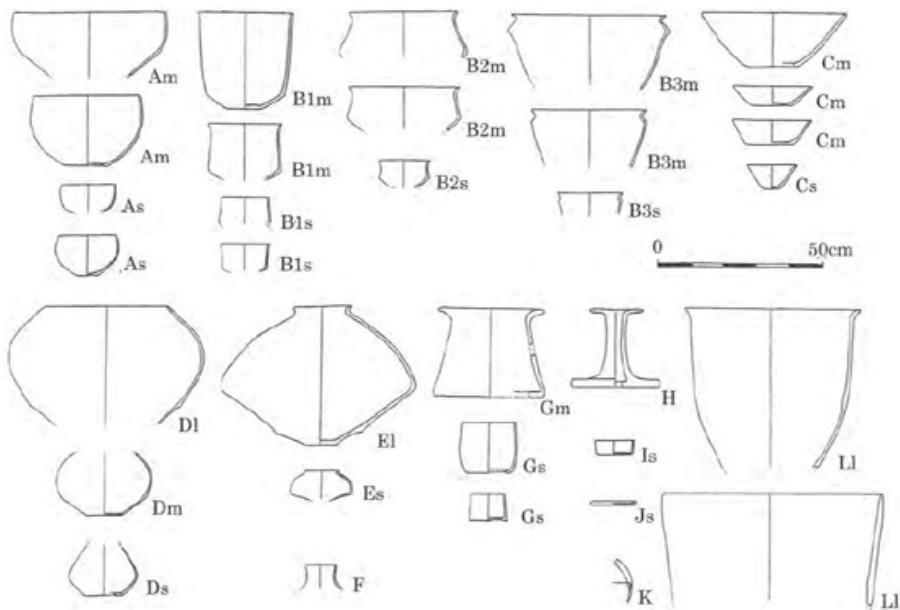


Fig.11.9 Main pottery forms at Tappeh Sang-e Chakhmaq, east tappeh.

Group 1 consists of the red-on-buff painted pottery found in all layers of the east tappeh (Fig. 11.10). It is characterized by its heavy chaff-tempered and reddish-brown-colored paste. Dark cores were often visible in thin section. The pottery's surface was often decorated with buff-colored slip and geometric patterns painted in a reddish color. The exterior surfaces were usually well-burnished. The main forms are type A bowls, type B carinated bowls, type D hole-mouthed jars, type G cups, and type H stands (Fig. 11.9). The most frequently painted designs belong to the pattern Nos. 1–19 for outer surfaces and Nos. 21–24 for inner surface rims (Fig. 11.12).

The painted pottery type known as Group 2 started to appear in layer III of the east tappeh (Fig. 11.11). In layers II and I, this group became dominant, replacing Group 1. Both the pottery's surface and paste are reddish-brown. The surface was often decorated with reddish-brown or buff-colored slip. The surface was normally wet-smoothed and unburnished. The paste was usually well-levigated, especially in the case of small vessel forms, but sometimes contained chaff temper. In regard to well-levigated pottery, a dark core was not observable in the thin section. The reddish-brown outer surface was painted with black design patterns on a red-slipped surface. These designs include both geometric and naturalistic patterns. The main pottery forms include type A bowls and type C shallow bowls (Fig. 11.9), while the most commonly painted designs are pattern No. 20 and Nos. 25–37 (Fig. 11.12).

The plain pottery type consists of large jars and other characteristic forms, such as husking trays and small, shallow cups. Husking trays were only discovered in layers III–I of the east tappeh (Fig. 11.13). The number of thin black-burnished pottery specimens recovered from layers of the east tappeh was very small. Five pieces were collected in the excavations, but only two were stored in the University of Tsukuba (Fig. 11.14). We do not find comparable samples in other Neolithic sites in Northeast Iran.



Fig.11.10 Group 1 Painted Pottery (Tappeh Sang-e Chakhmaq).



Fig.11.11 Group 2 Painted Pottery (Tappeh Sang-e Chakhmaq).

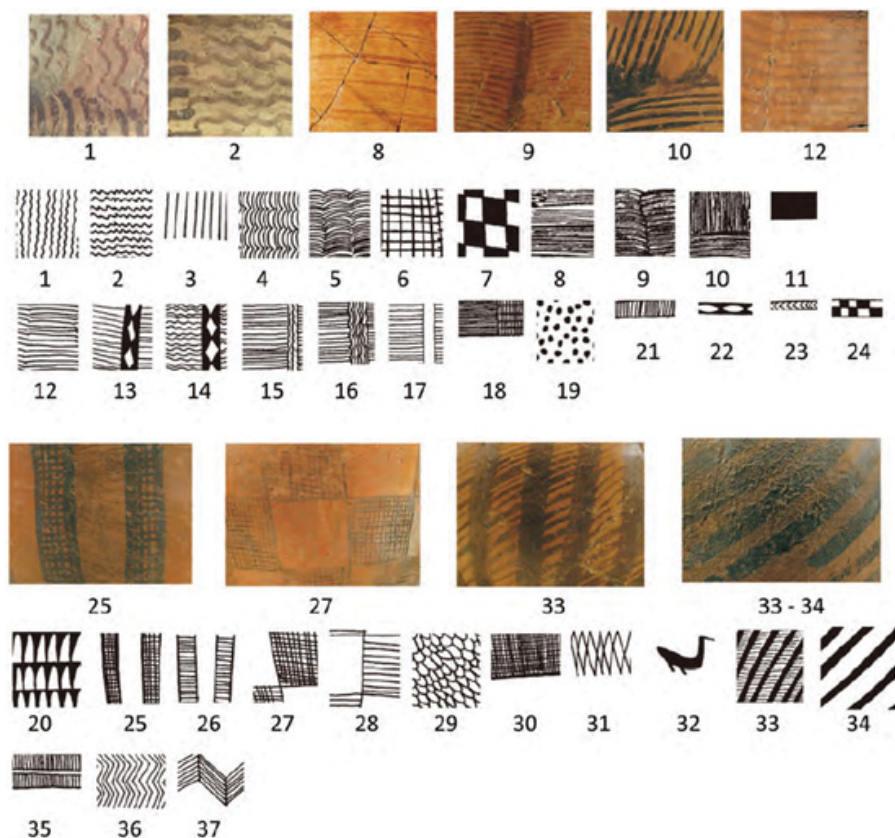


Fig.11.12 Main painted patterns of Group 1 Painted Pottery.

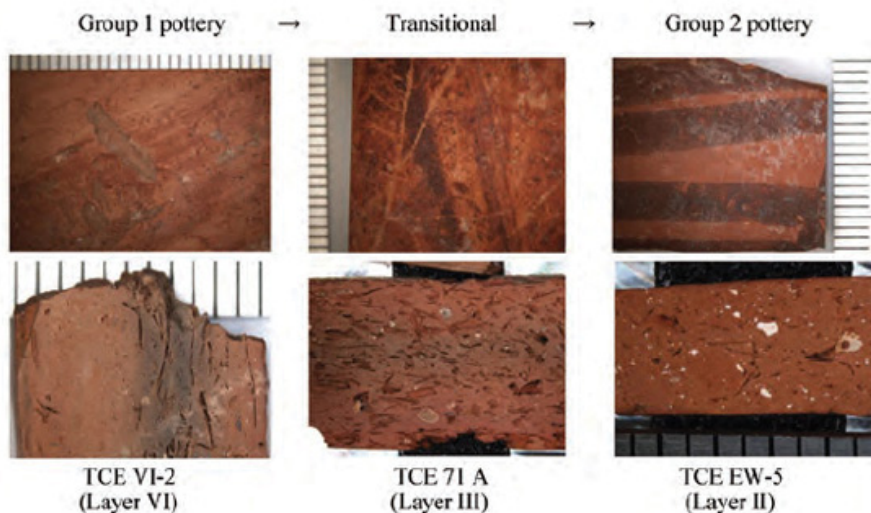


Fig.11.13 Surface and paste changes from Group 1 to Group 2 pottery (thinner vessel walls, rarer chaff temper and disappearance of the dark core). Image provided by Dr Kurosawa.

Discussion

All of the cultural materials discovered from the west and east tappehs at Sang-e Chakhmaq indicate that these sites were essentially farming villages based on a food-producing economy. Both tappehs yielded domesticated types of einkorn, emmer wheat and naked barley as well as a large number of bones from domestic sheep and goat. The chipped stone tools in both tappehs consist of four main types: sickle elements, trapezes, drills and scrapers. Sickle elements with silica-sheen were especially numerous. Bone sickle hafts were common, and stone mortars and pestles for processing flour were also discovered on occasion. Imported items such as obsidian and seashell beads indicated that Neolithic societies at Sang-e Chakhmaq were involved in trade with distant places and societies. Human and animal figurines, including an elaborate stone sheep, and bone hafts with beautifully engraved animal figures suggest a well-developed craft technology. This evidence leaves no doubt that human settlements at Sang-e Chakhmaq represented well-developed farming societies from the beginning.

Pottery appeared rather suddenly in these developed Neolithic societies at Sang-e Chakhmaq, as seen in layer III of the west tappeh. As mentioned above, these settlements were essentially those of Pre-Pottery Neolithic societies and pottery did not play an important role at that time. The number of potsherds was too small and only fragmented pieces were found. In addition, they were not coarse potsherds but instead were red-washed and burnished. This suggests that these vessels were not useful tools but were more likely to have had a symbolic purpose at Sang-e Chakhmaq. Considering the potsherd attributes from the west tappeh, we see similarities to the Caspian Neolithic Soft Ware. Therefore, we suggest that the newly established farming villages at tappeh settlements had interactions with local hunter-gatherers living in the caves through exchanging symbolic items such as pottery.



Fig.11.14 Husking trays from Layers I – III of the east tappeh.



Fig.11.15 Thin black burnished ware (Tappeh Sang-e Chakhmaq).

However, the status of pottery in the east tappeh societies at Sang-e Chakhmaq was quite different from the west tappeh societies in that it

played a substantial role in everyday life. Pottery was one of the most ubiquitous tools in their households. The variety of forms, ranging from small bowls to large jars, indicates that pottery was used for ordinary domestic life as well as social and ritual purposes. Therefore, from the beginning of occupation at the east tappeh, Sang-e Chakhmaq societies were part of the Pottery Neolithic phase.

Similarities between the ceramics and other cultural factors of Sang-e Chakhmaq and Jeitun in southern Turkmenistan have been discussed at length (e.g., Masuda 1976, Harris 2010). The Jeitun culture was divided into the Early, Middle and Late Jeitun periods by Berdief (1969, Harris and Coolidge 2010). Overall, attributes of the Jeitun culture are represented at Sang-e Chakhmaq by building structures of the west tappeh, lithic artifacts of both tappehs and the Group 1 painted pottery of the east tappeh.

It is notable that the clearest similarity between Sang-e Chakhmaq and the Early Jeitun culture involves Group 1 painted pottery from layers VI and V of the east tappeh. Attributes such as paste, surface treatment, painted designs and forms are remarkably similar. Although each painted design evolved concurrently in both regions, the prototype pattern (No. 8) for all painted designs was observed only at Sang-e Chakhmaq (Fig. 11.12). This motif probably originated from the 'red-washed decoration' of layer VI pottery. Therefore, we suggest that the older Sang-e Chakhmaq represents the progenitor of the Jeitun culture.

We observed several similarities in pottery from the Middle Jeitun period to Group 1 painted pottery from layers IV and III of the east tappeh at Sang-e Chakhmaq. However, unlike the Early Jeitun, not all attributes of Middle Jeitun pottery were the same. For example, it appears that the painted designs developed independently in each region (Fig. 11.15). From this evidence, we conclude that Neolithic settlements in each region might have developed independently in the Middle Jeitun era.

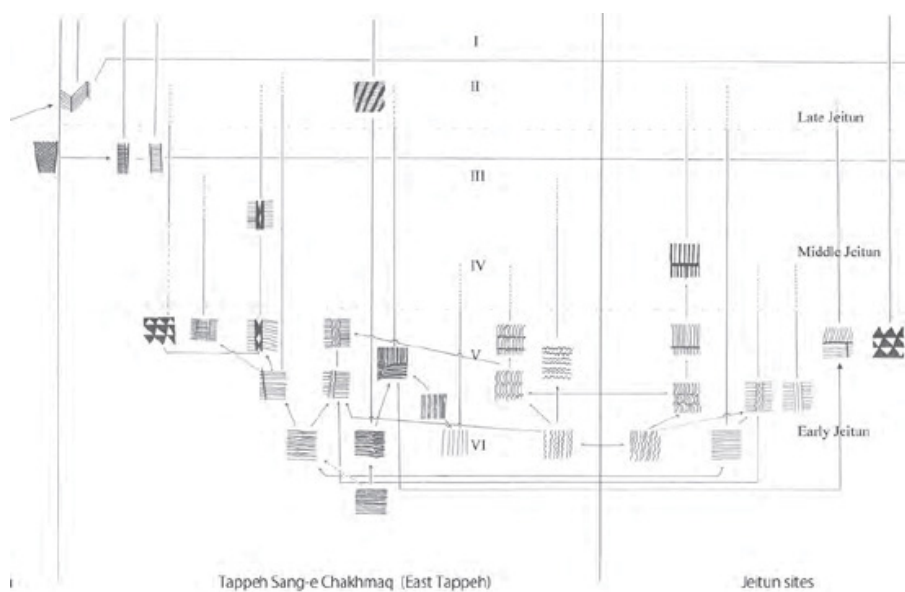


Fig.11.16 Comparison of pottery painted designs between Tappeh Sang-i Chakhmaq and Jeitun.

In layers II and I of the east tappeh at Sang-e Chakhmaq, we observed few similarities between Group 1 painted pottery and Late Jeitun pottery. Instead, Group 2 painted pottery appeared in layer III and then became the primary type in layers II and I. Some attributes of Group 2 painted pottery, such as paste, color, firing technique, and certain painted designs and vessel forms were probably established as the result of interactions with cultures in central Iran. In particular, attributes of the pottery type known as Cheshmeh Ali were fused into the old pottery tradition and established as the new Group 2 painted type in Sang-e Chakhmaq. Some of these attributes expanded further to the east, and were then established in the pottery type called Anau IA.

In summary, the pottery sequence at Tappeh Sang-e Chakhmaq represents a case study for the emergence of pottery in the peripheral areas of Neolithisation. The initial pottery appeared in the Pre-Pottery Neolithic farming societies as symbolic items. Then, after a few hundred years, stable pottery production began in order to provide vessels to be used for both ordinary and social life. Pottery then became principal item for human societies. Early stable pottery assemblages were distributed quite extensively, followed by a time when each region began to develop its own pottery tradition. The distribution of these regional pottery types tended to be narrower than the earliest stable pottery.

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Chapter 12

Absolute Dating and the Early Pottery of South-west Asia

Stuart Campbell

Introduction

Although, in comparison to Europe at least, pottery appeared at a relatively early date in West Asia, it is far from the earliest in the world. On the basis of current knowledge, the earliest pottery has probably been found in east Asia. In southern China, in the Far East of Russia and in Japan possible dates may be as early as c.14,900–14,500 cal. BC (Kuzmin 2006; Kuzmin et al. 2009). Recent dates of c.16,000–15,800 cal. BC are associated with sherds in the Yuchanyan Cave in south China (Boaretto et al. 2009). North Africa provides another context in which pottery appeared earlier than in West Asia. A ceramic assemblage dating from before 9,400 cal. BC has recently been identified in Mali (Huysecom et al. 2009). Pottery appears along the southern edge of the Sahara around 9,000 cal. BC (Jesse 2003) and in the Nile valley around the same time (Khabir 1987). So the question of the appearance of pottery in West Asia need not focus specifically on the question of how early it can be dated but rather on the more productive questions of why and in what social context it appeared.

This paper takes a specifically chronological perspective, but one that aims to be in the context of social interpretation. The early stages of the ceramic Neolithic in northern Mesopotamia have been one of the most active focal points of research in the last 15 years and many of the questions that research is posing have critical chronological aspects. The relative speed of the adoption of ceramic containers appears to have been different across West Asia. It has often been assumed, for example, that the southern Levant adopted pottery at a later date than northern Mesopotamia. More recently, it has been suggested that the introduction of ceramics in northern Iraq may have been relatively late (Nishiaki and Le Mièrè 2005: 66). Most strikingly, pottery was adopted very late in Cyprus, despite the closer links that are visible between that island and the mainland during the Aceramic Neolithic. Different elements may be involved, although it seems likely that the social context, the use that can be made of pottery for

cooking, consumption or display, may be more important than access to technical knowledge. Disentangling the sequence of adoption, adaptation and spread is an important element of its interpretation.

On a more detailed level, similarities in technology and shape of early pottery at sites in north Mesopotamia, combined with hints that some of the earliest was not made locally, suggests that inter-relationships between contemporary sites may have been important, perhaps as a socially inter-linked network which may have shared elements with a pre-existing exchange of material such as obsidian. The extent to which this did, in fact, constitute a 'horizon', indicating a specific social phenomenon which covered a wide area, has so far been mainly examined from a typological perspective rather than an explicitly chronological one.

I have argued previously that in archaeology chronology and social interpretation should be closely linked and that one cannot easily be dissociated from the other (Campbell 2007). This is particularly the case with the early ceramics. We need to be precise about what questions we are asking and how they correlate to particular patterns of social behaviour. It is easy to ask "what was the date of the first pottery in northern Mesopotamia?". It is not only harder to answer but the question itself can mean several things. It might be reasonable to suggest that there are at least three possible definitions that are relevant and each may give different answers.

1. What was the earliest example of vessels made from clay, whether fired or not? It has been clear for a long time that clay has a long history in the archaeological record of West Asia (Schmandt-Besserat 1974, 1977a, 1977b; Vandiver et al. 1989). In particular, its use for things other than vessels together with the development of pyrotechnologies, such as production of lime plaster, suggests that the potential to produce pottery existed for a long time before it became commonplace (e.g. Moore 1995). Furthermore, the occasional appearance of fired clay vessels may suggest that pottery might have actually been invented more than once but did not provide a technology that became widely adopted. Since archaeology provides such a partial record of the past, it is likely that these examples of 'aceramic' Neolithic pottery represent a repeated phenomenon. Thus the first phase of the use of fired clay might be seen as one in which pottery was repeatedly invented and abandoned; in which the potential to make pottery always existed but was not exploited because the context for its sustained adoption was not present.

2. When did pottery become a class of material that was continuously manufactured? This is the point at which the invention

of pottery was adopted as a continued technology. However, knowledge of the technique may well have remained very restricted and the range of contexts in which pottery was used may have been limited. The creation and use of pottery may have had special meanings and it may have had a distinctive socially specific role. One might expect the range of type of pot, in terms of fabric, size and shape, to be potentially more limited.

3. When did pottery become a ubiquitous technology? This is the stage that is familiar to most Near Eastern archaeologists, where pottery is one of the most common archaeological finds. At this point the knowledge of the technology was very widespread, probably transmitted within individual households and where large numbers of people participated in its production. Equally the use of pottery at this stage would permeate a very wide range of contexts and it would be used to convey a very varied range of socially constituted messages.

Such a multi-step approach is not new, although the detail of individual steps has varied. Vandiver (1987) argued that the development of pottery in West Asia was a “two step process in which forming developed first and independently of firing” (Vandiver 1987: 10). She emphasised the possible links to plaster and architecture as well as to a wider “soft stone technology” (Vandiver 1987: 29) in which a range of “earthy pastes” were being used to make a variety of objects. In a cross-cultural study, Rice (1999: 37) has suggested that an earlier “software horizon”, using Dyson’s term (1965), was part of an emergence of prestige technologies, likely to have low visibility due to poor preservation but preceding large scale pottery use. To her, early fired pottery may have happened in the context of aggrandizers driving technological change, perhaps with culinary associations, while widespread adoption was a subsequent stage, which may have either been driven as a prestige or a practical technology. Brown (1989: 602) noted this distinction and that “the earliest use of pottery was likely different from whatever functions it served after becoming well established”. In a more specific West Asian context, a three stage development of pottery technology has been outlined (Le Mièvre and Picon 1998; Le Mièvre 2009).

The first question, the initial, sporadic appearance of pottery vessels in otherwise ‘aceramic’ contexts, will not be discussed in great detail here, although the chronological model for Ganj Dareh in particular has relevance. There is no doubt that fragments of vessels made from clay appear at a number of sites over a long time range. Fragments of pottery have been found in PPNB contexts in the southern Levant at ‘Ain Ghazal (Rollefson and Simmons 1985), Beidha (Kirkbride 1966)

and Basta (Nissen et al. 1987). They also occur at a slightly earlier date at Mureybit (Cauvin 1974). The example of Ganj Dareh in the western Iran is discussed in more detail below. It is possible that many of these objects were not deliberately fired but are only found where accidental burning has preserved them (Le Mière and Picon 1998: 7–10). For example, three coarse sherds were Absolute Dating and the Early Pottery of South-west Asia found at Demirköy in eastern Anatolia (Rosenberg and Peasnell 1998: 199, Fig. 6). The excavators argued that they may have been deliberately fired. Two radiocarbon dates place Demirköy in the second half of the 10th millennium cal. BC (Higham et al. 2007: S22–23).

The main aim of this paper is to discuss the second question, particularly for northern Mesopotamia. Major sites in adjacent regions will also be considered because they provide an important wider context. The appearance of pottery in small but consistent numbers is relatively straightforward to identify, simply because it is almost invariably identified by archaeologists as important and consequently reported. It has also been the subject of a series of important recent publications (e.g. Tsuneki and Miyake 1996; Le Mière and Picon 1998; Balossi 2004; Nishiaki and Le Mière 2005; Balossi Restelli 2006; Conroy 2006; Le Mière 2009; Nieuwenhuyse 2009; Gregg 2010; Nieuwenhuyse et al. 2010). The third question, the point at which pottery becomes a ubiquitous technology, is also considered to some extent. It is harder to approach, however, because information on quantification of early pottery assemblages is much more variably reported, and almost never in terms that allow the absolute frequency of pottery manufacture, use and discard to be assessed.

Although the main focus here will be on chronology, the significance of early pottery use in all its stages is to be sought amongst a wider set of factors, in which changing materiality, patterns of food preparation and consumption may be included. In this context a thorough consideration of the temporal dynamics of its inception and spread should consider a wider range of manufactured items, resource intensification and elaboration of material culture.

Absolute dating

In 1998, Le Mière and Picon could correctly note that there were not many dates for early ceramic sites in West Asia (Le Mière and Picon 1998). That is certainly no longer the case, as in the years since then several sites have produced multiple relevant dates. So far, however, their potential has not been fully exploited. Although all recent publications have cited calibrated dates, very few have taken

advantage of the developments in calibration using Bayesian statistics. This is unfortunate as all the recent dates come from sites with stratigraphic sequences, exactly the context in which Bayesian calibration can have the greatest power because we know a lot about the order in which dates must fall.

Calibration using Bayesian statistics has been largely developed in the last 20 years (Buck et al. 1991; 1992 and 1994). It incorporates the prior beliefs about the relationship of the dated samples, particularly their known stratigraphic position, into the analysis and can produce a more precise posterior belief, the actual calibrated dates. Thus, the fact that the strata from which one date originates is known to be earlier than the one from which a second dates comes can be used to restrict the possible calibrated ranges of both dates. Furthermore, where dates appear out of stratigraphic order, their compatibility with their stratigraphic position can be judged probabilistically rather than subjectively. It is computer intensive but, with the availability of user-friendly programmes, is moderately simple and rapid to use.

This study uses Bayesian calibration on a series of sites relevant to the appearance of early ceramics in the northern sector of the ancient Near East. Because the emphasis here is on establishing an absolute chronology, as an independent test of relative, typologically derived chronologies, the sites have been chosen by the presence of stratified sequences of recent radiocarbon dates. Sites which provide significant data on early ceramics have been omitted where the deposits are not as well dated, or where recent dates are unavailable.

The approach used here is similar to that utilised in a previous study (Campbell 2007). A formal chronological model was first constructed for each site. At its simplest, the stratigraphy of the site is used to sort the dates into a sequence made up of individual phases. In several cases, where the material came from different trenches without a stratigraphic link, the relative chronology proposed by the excavator was used. This model was then implemented using OxCal version 4.1.5 (Bron Ramsey 1995; 2001; 2009), using the IntCal09 calibration curve (Reimer et al. 2009). The Sequence and Phase structures were used to define the stratigraphic groupings. Start and end events were added for the sequence using the Boundary statement. In most cases, the Boundary statement was also used between phases, since it is this period of transition that is usually the focus. Different models were used to evaluate which one best represented the data, and sometimes two Boundary statements between phases were useful, especially where there was a possible gap

in the sequence.



Fig.12.1 Sites discussed in the text.

The agreement index generated by OxCal was used to assess how satisfactorily the radiocarbon dates fitted the stratigraphically derived chronological model. Outliers were identified manually by using the individual agreement index in OxCal and testing them using the Outlier function (Bronk Ramsey 2009b). For the overall model, an agreement index below 60% indicates empirically that the fit between the dates and the model is equivalent to failing a conventional χ^2 test at the 95% significance level (Bronk Ramsey 1995, 428). Therefore, where the agreement index for the overall model fell below 60%, dates with a low probability of coming from their stratigraphic position were successively removed from the model until there was a satisfactory agreement index. Individual examples are discussed below. In a few cases, the overall model could be satisfactory even though one or more individual dates had an agreement index of slightly less than the 60% level. In these cases, the individual dates were retained. There was occasionally an issue where there were several dates which did not fit the model. The decision to remove a particular date can affect the subsequent fit of other dates to the new model; in other words the choice of which dates to remove can sometimes determine the outcome of the model. In general, where this was a concern, there was generally a wider issue, typically where dates from different laboratories seem to have a systematic offset (e.g.

Tell Halula or Salat Camii Yeni). In these cases, particular attention was paid to the impact of removing entire sets of dates from particular laboratories from the model. These examples are discussed where they occur.

In some cases, it was more useful to summarise the extent of phases at a site rather than seek to create boundaries between the phases. In particular, this was the case where there were possible gaps within the sequence and where dates could be grouped together in a phase but where there was not a detailed stratigraphic relationship between them. The Sum Absolute Dating and the Early Pottery of South-west Asia function in OxCal was used to produce a summed probability distribution (cf Wright and Rupley 2001; Blackham 2002). The Interval function was used to estimate possible gaps within sequence.

In total, 13 sites had sufficient dates from relevant levels to allow full chronological models to be run through OxCal (Fig. 12.1). There were 281 dates included in these models. Almost all the dates have been determined within the last 20 years so avoid some of the issues present with older dates. Most of the excavations are also relatively recent, with the consequent advantage that stratigraphic and sample retrieval is generally good. Most of the dates, although not all, have standard deviations of 40–60 years and most are accelerator dates, so the samples were typically on short-lived material that ought to relate to the contexts in which they were found rather than be produced from wood that was already old. Less positively, the dates were produced by no less than 16 different laboratories so, when inter-laboratory inter-comparability is less than perfect (Scott 2003), it may be an issue in this data set.

Although material of a variety of dates will be discussed, it is immediately clear that a key period is the end of the 8th millennium cal. BC and the beginning of the 7th millennium cal. BC. Unfortunately, the calibration curve is very problematic in exactly this time period (Fig. 12.2). Between c.7050 and 6850 cal. BC there is a plateau which means that, when calibrated, dates tend to spread out to encompass all this period. For many purposes, it is extremely difficult to differentiate events that could fall within this bracket, and the error band inherent to radiocarbon dates means that even an event which should date to just after it can appear as though it is 200 years earlier. There are more minor plateaus at c.7700 BP and c.7400 BP that may also be of relevance.

In general calibration dates and ranges are quoted here at a 68% confidence level. While quoting the two standard deviation range, to provide a 95% level of confidence that the correct date is included in

restricted to the dates from phase XXV and lower. The earliest date comes from the phase pre-XXXIII, which restricts the study to the phases which are of prime interest for the early stages of ceramic development at the site. There are 15 radiocarbon dates included, 12 from Rome (Caneva 1999: 109; Thissen 2007), two from Lecce (Caneva pers comm.) and one rather old USGS date with a very large standard deviation (Rubin and Alexander 1960, 183).

Phase	1 standard deviation	2 standard deviations
Start of Phase Pre-XXXIII	6907-6656	7187-6601
Boundary between Phase Pre-XXXIII and Phase XXXIII	6761-6598	6904-6530
Boundary between Phase XXXIII and Phase XXX	636-6511	6702-6465
Boundary between Phase XXX and Phase XXIX	501-6384	6564-6302
Boundary between Phase XXIX and Phase XXVIII	351-6206	6393-6128
Boundary between Phase XXVIII and Phase XXVII	103-6001	6199-5941
Boundary between Phase XXVII and Phase XXV	008-5912	6039-5849

Table 12.1 Chronology of Yumuktepe.

These dates produce a strong chronological model, with an overall agreement of 142.8% (Table 12.1). Some of the phases lack radiocarbon dates, which means that there are gaps in the data, but this model should still give a good summary of the absolute dates of pottery development at Yumuktepe during the 7th millennium cal. BC. Taking the results at a single standard deviation minimises the impact of the plateau in the calibration curve and suggests that the pottery sequence at Yumuktepe may have started no earlier than 6,900 cal. BC. The start of the sequence, however, may have been significantly later. Allowing time for phases of archaeological deposits missing in the model to accumulate and acknowledging external parallels probably makes the latest part of the 1 standard deviation date range unlikely. However, dates between c.6900 and 6750 cal. BC are all possible for the start of the sequence and the regular appearance of pottery.

Rouj Basin

It seems clear that the Rouj basin sites provide a full sequence running from the PPNB through the Ceramic Neolithic. At present, however, the data from the initial phases of the Ceramic Neolithic is more limited. The earliest Ceramic Neolithic levels at Tell el-Kherkh 2, in

the Rouj 2a phase, have only been exposed to a limited extent (Tsuneki and Miyake 1996). The Rouj 2b phase is also less extensively excavated, being known from the sounding in Tell el-Kherkh 2 and in two trenches on Tell el-Kherkh 1. Consequently, although there are a large number of radiocarbon dates from the Rouj valley sites, only one comes from a Rouj 2a context and none from Rouj 2b contexts. Nonetheless, there are larger numbers of dates from the aceramic Neolithic phases Rouj 1a and 1b as well as the later Ceramic Neolithic phases Rouj 2c and 2d which should allow the period of interest to be placed within a broad framework.

This analysis is based on 54 prehistoric dates from Tell el-Kerkh 1 and 2 (Tsuneki pers. comm.; Tsuneki and Miyake 1996), five from the Rouj 1a phase, thirteen from Rouj 1b, one from Rouj 2a, twenty from Rouj 2c and thirteen from Rouj 2d. Most of the dates come from the NIES-TERRA laboratory but there are some from the University of California, Irvine, from the Tandetron AMS Laboratory, from Groningen and from Lyon. The date from Rouj 2a comes from the Nishina Memorial laboratory. Where these provide good agreement, this range of laboratories may increase confidence in the accuracy of the results.

Since the main aim of this analysis was to produce a frame within which the earliest Ceramic Neolithic phases can be placed the chronological model was kept simple, grouping the dates into the Rouj phases rather than ordering them stratigraphically within each phase. Some dates have a poor fit with their stratigraphic positions in the chronological model, although with this number of dates it is to be expected for a small number. In particular dates TERRA-110404c07, N-6548, TERRA-102804c1, TERRA-102804c37, TERRA-110404c05, TERRA-110404c17 and UCIAMS-21685 had to be removed from the model to produce an acceptable level of agreement. The date from Rouj 2a (N-6545) also had a rather poor fit with its stratigraphic position but was retained because the overall agreement of the model remained acceptable at 76.3% ([Table 12.2](#)).

	1 standard deviation	2 standard deviations
Start of Rouj 1a	6792-8483	5162-8354
Boundary between Rouj 1a and Rouj 1b	7763-7532	6395-7484
End of Rouj 1b	7239-7051	7296-6935
Start of Rouj 2c	6399-6309	6446-6274
Boundary between Rouj 2c and 2d	5971-5931	5980-5903
End of Rouj 2d	5712-5649	5728-5588

Table 12.2 Chronology of Tell el-Kerkh 1 and 2.

While the dates that the chronological model suggests for the boundaries of the Rouj 1a and 1b phases are probably reasonable, as are those for the Rouj 2c and 2d phases, the boundaries for the phases Rouj 2a and 2b are fairly meaningless apart from indicating that they must fall somewhere between 7239–7051 cal. BC and 6399–6309 cal. BC (at one standard deviation). Using the interval command in OxCal, the possible length of time that the gap between the end of Rouj 1b and the start of Rouj 2c is between 675 and 882 years (at one standard deviation). This is obviously very substantial and certainly need not only be filled with Ceramic Neolithic deposits. It is equally possible that Aceramic Neolithic levels, either unexcavated or undated, may fill the early part of the gap. In summary, although the wider chronology of Tell el-Kerkh and the Rouj basin is firmly anchored in radiocarbon dates, it is impossible to place a precise date on the start of the Ceramic Neolithic. It may be as early as the late 8th millennium cal. BC but it might be several centuries into the 7th millennium cal. BC.

Akarçay Tepe

Akarçay Tepe provides a sequence running from the PPNB to the Ceramic Neolithic. Pottery first appears in very small quantities in the First Pottery Neolithic phase and in substantial quantities in the Pottery Neolithic phase (phasing Miguel Molist pers. comm.; Arimura et al. 2000). There are 12 dates available from the site, all from Beta Analytic (Balkan-Atlı et al. 2002: 289; Miguel Molist pers. comm.). When placed in a single chronological model two dates appear to be incompatible with their stratigraphic position (beta-174038 and beta-138548); when these are removed from the model, the overall agreement is an acceptable 93.2% (Table 12.3).

Although the boundary identified by OxCal between the Late PPNB phase and the First pottery Neolithic is quite early at 7332–7056 cal. BC (one standard deviation), this may be misleading. There is a very long gap between this and the Pottery Neolithic phase (perhaps 500 or 600 years) and a gap in the sequence is possible, which would make a simple interpretation of the OxCal dates misleading. When the distributions of the dates for each phase are summed, it shows clearly that there is a possible gap in the sequence between late PPNB and the first Pottery Neolithic (Fig. 12.3). If the chronological model is structured with separate boundaries for the end of the Late PPNB and the start of the Pottery Neolithic, an acceptable level of agreement is still present (74.8%) and the dates for the Pottery Neolithic are more reasonable. The potential interval between these phases, at one

standard deviation, is between 18 and 378 years. This gives a range for the start of the first Pottery Neolithic Phase of 6952–6679 cal. BC. The boundary between the First Pottery Neolithic and the appearance of a more established, widespread pottery tradition is clearer at 6691–6540 cal. BC (at one standard deviation).

Mezraa Teleilat

Pottery first starts to appear in Phase IIIA at Mezraa Teleilat, although only in very small amounts in what has been termed a Transitional Period between the Pottery Neolithic and Pre-Pottery Neolithic (Özdoğan 2009: 29). Phase IIC has more regularly occurring pottery. Ten dates are available from Mezraa Teleilat (Özdoğan et al. 2003; Bischoff 2006). However, the dates come from a restricted set of loci; all but one date come from three contexts, and even share the same sample numbers. Therefore combining the dates within each context appears justified. The conventional t-test was used to establish whether they were statistically indistinguishable (Ward and Wilson 1981). Most of the dates pass this test, although AA-49102 fails the t-test for combination and is therefore omitted from this analysis. AA-49099 is also omitted as it doesn’t have a relative stratigraphic position.

	1 standard deviation (68.2%)	2 standard deviations (95.3%)
Start of Mid-Late PPNB	7658-7553	7819-7528
Boundary between Mid-Late PPNB and Late PPNB	7446-7346	7476-7250
End of Late PPNB	7326-7045	7393-6847
Start of First Pottery Neolithic	6952-6679	7162-6651
Boundary between First Pottery Neolithic and Pottery Neolithic	6691-6540	6770-6471
Boundary between Pottery Neolithic and Late Pottery Neolithic	6348-6169	6431-6101

Table 12.3 Chronology of Akarçay Tepe.

The final chronological model is simple with two combined dates from Phase IIIB2 (from loci 38 and 62) and one from Phase IIB (locus 100). The model has a good index of agreement of 101.8% (Table 12.4). Phase IIIB2 immediately predates the earliest pottery so would suggest that the first appearance of pottery may have been after 6936–6756 cal. BC (at one standard deviation). By Phase IIB pottery was well established, and it is preceded by Phase IIC in which pottery was relatively common and Phase IIIA in which was very rare. This might suggest that the first pottery may have appeared c.6800–6700 cal. BC.

Tell Halula

Tell Halula provides a further example of a site that spans the transition from the Aceramic to the Ceramic Neolithic. There are 25 dates available in this analysis, 18 from Beta Analytic, five from the University of Barcelona and two from Lyon (Molist 1996: 71; Molist 1998: 129; Molist pers. comm.). There are several issues with these dates. At 35800 ± 530 BP, Beta-58931 is clearly far too early for the Late PPNB context from which it came and can simply be omitted. When the remainder of dates are placed in a single chronological model, the dates from the University of Barcelona consistently fail to have a high probability of fitting their stratigraphic context; the outlier option in OxCal calculates the probability that UBar-290, UBar-384, UBar-394, UBar-395 and UBar-396 match their apparent contexts at less than 20%. When the model is run omitting all these dates, the overall index of agreement for the remaining 19 dates is an acceptable 90.6.

	1 standard deviation	2 standard deviations
Start of Phase III B2	7057-6656	7284-6774
End of Phase III B2	6936-6756	7016-6670
Possible interval	0-196 years	0-333 years
Start of Phase II B	6759-6594	6869-6521
End of Phase II B	6645-6453	6737-6074

Table 12.4 Chronology of Mezraa Teleilat.

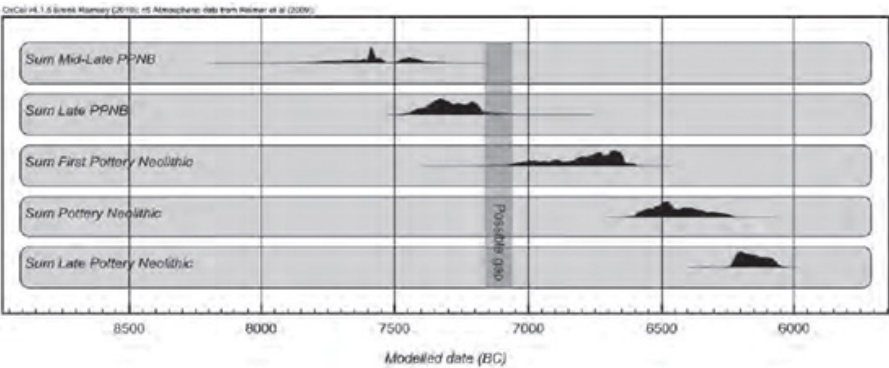


Fig.12.3 Sum of the distributions of date from Akarçay Tepe, showing the possible gap in dated deposits between the late PPNB and first Pottery Neolithic.

As with Akarçay Tepe, the early date for the boundary between Late PPNB and Pre-Halaf may be misleading because the sequence may not be continuous. This is confirmed when the distributions of the dates for each phase are summed (Fig. 12 4). There may be a gap of perhaps 100–200 years between the dated Late PPNB deposits and the earliest

Pre-Halaf deposits. The chronological model was run again, using one Boundary command in OxCal for the end of the Late PPNB and a second for the start of the Pre-Halaf. This model produced an overall agreement index of 103.8% and its results are probably to be preferred, and are quoted in [Table 12.5](#). This gives a date for the start of the Pre-Halaf of 7108–6786 cal. BC, but it is clear that this may be largely the product of the early 7th millennium cal. BC plateau in the calibration curve. While a finer chronological structure for Tell Halula, dividing the Pre-Halaf phases into smaller units, would certainly help, on present evidence, the appearance of ceramics prior to 7000 cal. BC is not impossible but is certainly not conclusive.

Shir

Shir is in a significant location, providing a potential bridge between the southern Levant and early ceramic sites further north (Bartl et al. 2008, 2009). The whole sequence is Ceramic Neolithic so it does not actually establish the earliest appearance of pottery, but the characteristics of the assemblage suggest that it ought to be very early in its development (Nieuwenhuyse 2009). The earliest cultural material from the site comes from burnt deposits immediately above natural and followed by 6 later building levels, apparently without significant breaks in the sequence.

There are 7 published dates from Shir, all from the Kiel laboratory (Bartl 2009: 145). Since they come from successive phases they should be ideal for understanding the chronology of the site, although since they do not all come from deposits with a direct stratigraphic relationship the phasing of the excavators must be followed. The date from level I (KIA-34436) has a very poor agreement with its stratigraphic position (0.4%), but with its omission the overall agreement for the model is good at 97% ([Table 12.6](#)). While the earliest part of the date range for the start of the basal burnt layer runs as early as the late 8th millennium cal. BC, this is partly because of the plateau on the calibration curve. The boundary at the end of level III is 6740–6654 cal. BC (at one standard deviation) and even at two standard deviations the earliest date is only 6809 cal. BC. Unless building levels I and II were particularly long lived or have gaps between them, it seems unlikely that the initial phases of the site are as early as 7000 cal. BC. Perhaps c.6900–6800 cal. BC is more likely for the beginning of the Shir sequence.

	1 SD	2 SD
Start of Mid PPNB	9525-8484	10974-8288

Boundary of Mid PPNB and Late PPNB	7647-7576	7715-7551
End of Late PPNB	7443-7303	7473-7174
Start of Pre-Halaf	7106-6786	7291-6700
End of Pre-Halaf	6410-6156	6464-5815

Table 12.5 Chronology of Tell Halula.

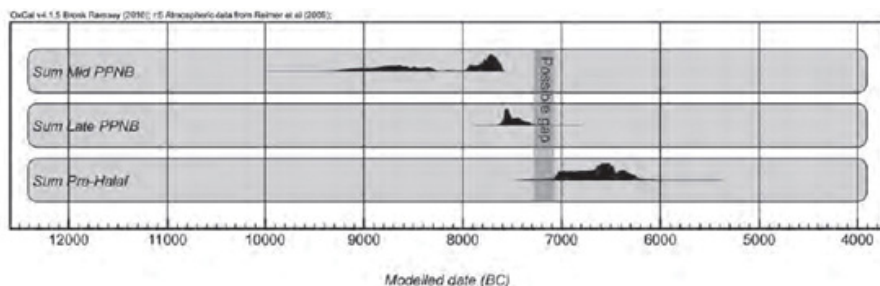


Fig.12.4 Sum of the distributions of date from Tell Halula, showing the possible gap in dated deposits between the late PPNB and first Pottery Neolithic.

Sabi Abyad

Early ceramics have been discovered in different trenches at three of the mounds at Tell Sabu Abyad, tells I, II and III (Nieuwenhuys et al. 2010). What is termed the Initial Pottery Neolithic, in which ceramics are extremely rare, is succeeded by the Early Pottery Neolithic, in which pottery was markedly more common. At Tell Sabi Abyad II and Tell Sabi Abyad III the Initial Pottery Neolithic lies above Late PPNB deposits while at Tell Sabi Abyad I it is overlain in Operation III by a long series of later Neolithic levels.

In general, this sequence can be dated through a good group of dates (Table 12.7).

In this analysis 23 dates have been used from the PPNB, Initial and Early Halaf, and the Pre Halaf phases (Verhoeven and Akkermans 2000; Akkermans et al. 2006; Nieuwenhuys et al. 2010). Almost all are accelerator dates from the Groningen laboratory but there is also a single UtC date. The PPNB dates from Tell Sabi Abyad II can be used to provide a constraint on the earlier boundary of the Initial Pottery Neolithic and the later pre-Halaf and Halaf dates provide a solid later constraint on the Early Pottery Neolithic phase. There are some issues in how best to model parallel periods in different trenches where there isn't a direct stratigraphic link. The excavators' interpretation is presumably largely based on typological links and potentially the dates could be used to test this. In the present context, however, the aim is less specific and I have simply followed the excavators' opinion.

The chronological model combining the stratigraphic positions of

the dates with the typological links between the different excavated sequences is convincing. However, two dates from the Early Pottery Neolithic phases (GrN-28855 and GrN-26928) have low individual indexes of agreement with their stratigraphic positions. With these dates omitted, the overall model has an agreement of 101.3%.

This model suggests that, at 1 standard deviation, the start of ceramics may have been 6976–6866 cal. BC. Ceramics may only have started to appear more extensively 150–200 years later in the Early Pottery Neolithic, 6805–6635 cal. BC.

	1 standard deviation	2 standard deviations
Start of Burnt layer	7090-6845	7198-6823
Boundary between Burnt layer and Layer II	6906-6738	7004-6716
Boundary between Layer II and Layer III	6805-6705	6914-6673
Boundary between Layer III and intermediate layer	6740-6654	6809-6617
Boundary between intermediate layer and layer IV	6661-6561	6696-6496
Boundary between layer IV and Layer VI	6561-6471	6592-6454
End of Layer VI	6522-6407	6553-6317

Table 12.6 Chronology of Shir.

Çatalhöyük

No pottery has yet been found in the deepest levels (Pre-XII) of Çatalhöyük but this may simply be due to the small sample of external deposits. Levels XII and XI have only 2 and 3 sherds respectively and this could also be a sampling issue. On the other hand, rather than being full Ceramic Neolithic, it is possible, although perhaps unlikely, that this represents the very low density of ceramics that can be seen in PPNB contexts at other sites. Pottery certainly becomes more commonplace in levels X and IX, although it is only with level VIII that the sample is sizeable (Last 2005: 103). Although these changing quantities may reflect sample sizes, it is suggested that the changing density of use is real (Last 2005: 131).

There are a large number of radiocarbon dates from Çatalhöyük (Table 12.8), and an extensive evaluation of them using Bayesian statistics has already been published (Cessford 2005). The analysis here essentially follows that publication, although its presentation is limited to the level VII and earlier as they are of primary interest in this context. Therefore the dates published by Cessford are used and the omission of dates judged by him to be of low reliability is followed (Cessford 2005: 66–79). In total, 38 dates were retained and used in

this analysis. The chronological model used here is therefore essentially identical but has been evaluated using OxCal, to allow intercomparison with the other analyses in this study, rather than BCal (Buck et al. 1999) which was used in Cessford's analysis.

	1 standard deviation	2 standard deviations
Start of Late PPNB	7760-7534	8155-7386
Boundary between the Late PPNB and the Initial Pottery Neolithic	6976-6866	7023-6841
Boundary between the Initial Pottery Neolithic and the Early Pottery Neolithic	6805-6635	6887-6404
Boundary between the Early Pottery Neolithic and the Pre-Halaf phase*	6236-6166	6265-6102

*This is probably not correctly modelled here as it does not include all the Pre-Halaf dates, which are the focus of this paper.

Table 12.7 Chronology of Tell Sabi Abyad.

	1 standard deviation (68.2%)	2 standard deviations (95.3%)
Start of Phase Pre-XII.D	7352-7179	7494-7109
Boundary between Phases Pre-XII.D and Pre-XII.D	7264-7133	7349-7088
Boundary between Phases Pre-XII.D and Pre-XII.C	7161-7079	7226-7063
Boundary between Phases Pre-XII.C and Pre-XII.B	7085-7026	7130-6971
Boundary between Phases Pre-XII.B and Pre-XII.A	7055-6960	7063-6880
Boundary between Phases Pre-XII.A and XII	7047-6856	7054-6847
Boundary between Phases XII and XI	6952-6818	7043-6786
Boundary between Phases XI and X	6885-6761	6950-6710
Boundary between Phases X and IX	6793-6687	6856-6661
Boundary between Phases IX and VIII	6716-6651	6772-6639
Boundary between Phases VIII and VII	6675-6634	6701-6607

Table 12.8 Chronology of Çatalhöyük.

The chronological model for the levels of Çatalhöyük below level VI has a high agreement (137.9%) even though two individual dates fall below the 60% level of satisfactory agreement (the combined dates OxA-9775 and OxA-9948, and P-782). The first sherds of pottery appear after 7047–6856 cal. BC (at one standard deviation) in level XII and it is not until after 6716–6651 cal. BC that pottery become

commonplace. This assemblage is predominantly vegetable-tempered and from thick walled vessels, but fine mineral temper was also used and there are rare examples of thinwalled, dark faced, mineral tempered fabrics as well (Last 2005: 104–105).

Tell Seker al-Aheimar

Tell Seker al-Aheimar provides the key information for the beginning of pottery use in the Khabur (Nishiaki and Le Mière 2005). Pottery appears within a sequence that runs from the Middle PPNB to the Proto-Hassuna, and importantly there are strong indications that the portion of the sequence in which ceramics appear was continuous. The analysis here is based on the 12 dates currently published (Nishiaki and Le Mière 2005: 65). Of those 12 dates (10 TKa and two MTC), MTC-04349 has a very poor agreement with its excavated position (as already noted in Nishiaki and Le Mière 2005: 65) and is omitted from the final model. With this date removed, the overall agreement for the Tell Seker al-Aheimar is 110.5%. Although this chronological model is convincing, it is not altogether useful for dating the appearance of ceramics. There is only a single PPNB date, which provides a poor constraint on the beginning of the first pottery phase, the Pre-Proto-Hassuna phase. Furthermore, this date comes from Sector C, level 8 while the next date in Sector C comes from level 4, suggesting a gap of uncertain length. Equally, there are no published dates from the later Ceramic Neolithic levels, the Proto-Hassuna, to constrain the end of the Pre-Proto-Hassuna phase. Treating the Pre-Proto-Hassuna dates as a single bounded phase on its own may be more helpful. Omitting MTC-04349, gives a chronological model with high overall agreement of 183.4% starting 6756–6630 cal. BC and ending 6660–6557 cal. BC (both at one standard deviation).

	1 standard deviation
Boundary between PPNB and Pre-Proto-Hassuna	6750-6700*
Boundary between Pre-Proto-Hassuna and Proto-Hassuna	6500-6450*

*Dates provided at the conference.

Table 12.9 Chronology of Tell Seker al-Aheimar.

However, Nishiaki and Le Mière (this conference) have presented the results of Bayesian calibration drawing on a much larger data set of 50 dates. This obviously should provide a much more reliable and precise set of conclusions, particularly because the major weakness in using the published dates is that there is only a single date from PPNB

contexts. That analysis is clearly to be preferred and will be used in the discussion in this paper ([Table 12.9](#)).

Salat Camii Yanı

There are two sets of radiocarbon measurements from Salat Camii Yanı; 12 are UCIAMS dates and nine are TKa dates. These are difficult to reconcile in a single model, as the level of agreement in the OxCal model consistently falls to a very low level unless such a high percentage of dates are discarded that the results become arbitrary and meaningless. In isolation, the TKa dates are internally consistent, however, and produce an overall agreement index of 114%. To produce an agreement index of more than 60% for the UCIAMS dates on their own, four dates must be omitted (UCIAMS-21275, UCIAMS-21698, UCIAMS-21256 and UCIAMS-21257). Comparison between the results suggests that the model based on the TKa determinations produces dates that are c.200 years earlier than the dates from the model based on the UCIAMS determination. Compared to dates known from north Iraq that must post-date Salat Camii Yanı levels I and II, especially ones dating to the Proto-Hassuna (Nishiaki and Le Mièrè 2005), the results for the UCIAMS dates seem unfeasibly late. This suggests a systematic error in the UCIAMS dates and only the TKa dates will be considered further in this discussion.

Only two of the three phases have dates but they produce a high level of agreement (113.9%; [Table 12.10](#)). Although the start of Phase I and the end of Phase II are not constrained by earlier or later dates, the tightly clustered dates produce useful estimates for the phase limits. These suggest that Phase I starts slightly later than the earliest appearance of pottery at Seker al-Aheimar, perhaps not surprising since there is no underlying PPNB at Salat Camii Yanı so it is unlikely that the first occupation would have coincided with the appearance of pottery exactly. The end of Phase II at Salat Camii Yanı coincides closely with the possible boundary in northeast Syria and north Iraq between the end of the PPH and the start of the PH – again something which is very consistent with Phase III at Salat Camii Yanı (which is without radiocarbon dates) being stylistically equated with Proto-Hassuna.

Ganj Dareh

A single chaff tempered sherd was found in level E (Smith 1978). In the following level D, hundreds of chaff-tempered sherds were found, as part of a rich and varied assemblage of clay objects. The excavators

found it difficult to distinguish whether these objects were lightly fired or sun-dried, partly due to the fire that had destroyed level D and perhaps incidentally preserved unfired clay objects.

35 dates are available from Ganj Dareh. The analysis here utilises the recent determination in Zeder and Hesse (2000) and Housley (1994) as well as Hole (1987), omitting some of the determinations from the 1970s. Further dates were omitted when they were not ascribed to a single strata (e.g. OxA-2100, Housely 1994). This gives a set of 25 dates from three laboratories, Beta, OxA and SI, and distributed across levels A to E. This group, however, is almost impossible to accommodate within a single model because of the number of dates that need to be omitted to give a satisfactory level of agreement; the choice of omitted dates starts to determine the chronological outcomes to an arbitrary extent. Restricting the analysis to the most recent set of dates, the 12 analyses from Beta Analytic (Zeder and Hesse 2000), provides more reliable results. Only Beta-108241 has a poor consistency with its stratigraphic location (A = 36.2%). With it removed, the agreement of the chronological model for the remaining 11 dates is an acceptable 85.2% (Table 12.11).

	Tka dates		UCIAMS	
	1 standard deviation	2 standard deviations	1 standard deviation	2 standard deviations
Phase I start	6602-6518	6656-6494	6379-6312	6368-6248
Phase I-II boundary	6561-6483	6581-6474	6344-6250	6350-6245
Phase II end	6506-6441	6566-6409	6332-6207	6343-6182

Table 12.10 Chronology of Salat Camii Yanı.

This analysis suggests that the total occupation at Ganj Dareh was short, probably starting just before 8000 cal. BC and ended early in the following millennium. At one standard deviation, OxCal suggests that the span of the entire sequence of occupation at the site was between 0 and 364 years.

Tepe Guran

At Tepe Guran, ceramics appear in a primitive form in level S (Meldgaard et al. 1964). Although there are 15 recent radiocarbon dates from animal bone collagen (Zeder 2005: 132), they are problematic because many fall out of stratigraphic order. In fact, seven of them have to be ignored (Beta-147112, Beta-147114, Beta-177116, Beta-147116, Beta-147118, Beta147120 and Beta-147121) to achieve an acceptable level of overall agreement of 69.7% for a calibration model in OxCal. Removing different

determinations will also produce acceptable models allowing the chronological model to be manipulated to produce different results, leaving the process arbitrary and questionable. Nonetheless, it can be used to suggest possibilities. There is no date from Level S, the earliest with pottery, but there are dates from both Level T (the final aceramic level) and Level R. The boundary between the two, which might approximate to the start of ceramics, is 7124–7011 cal. BC at 1 standard deviation.

	1 standard deviation	2 standard deviations
Level E starts	8215-8085	8250-7982
Level D-E boundary	8182-8045	8199-7990
Level C-D boundary	8118-8013	8171-7971
Level B-C boundary	8082-7970	8172-7954
Level A-B boundary	8011-7883	8169-7817
Level A end	7981-7768	8169-7637

Table 12.11 Chronology of Ganj Dareh.

Ali Kosh

Pottery is present for the first time in the Mohammed Jaffar phase at Ali Kosh (Hole et al. 1969). There are 14 recent dates from Ali Kosh, all produced by Beta Analytic, with four of them from the Mohammed Jaffar phase (Zeder 2005: table 2). Although these are not easy to merge with the earlier dates from the sites, perhaps most notably the accelerator dates from the Oxford laboratory (Housley 1994: 68), they make a reasonably acceptable set. Four dates fit poorly in their stratigraphic positions (Beta-108256, Beta-118721, Beta-177124 and Beta-118722) and produce levels of agreement below 60% for both the model and the individual dates. When these are excluded, OxCal suggests that the start of the Mohammad Jaffar phase may have been as early as 7526–7352 cal. BC (at 1 standard deviation; [Table 12.12](#)). The end of this phase is poorly controlled and the wide range of dates within it probably makes its estimated end date misleading.

	1 standard deviation	2 standard deviations
Start of Bus Mordeh phase	7611-7545	7731-7524
Boundary between Bus Mordeh and Ali Kosh phases	7562-7507	7581-7453
Boundary between Ali Kosh and Mohammed Jaffar phases	7526-7352	7549-7214
End of Mohammed Jaffar phase	6041-5694	6199-5193

Table 12.12 Chronology of Ali Kosh.

Discussion (Tables 12.13–12.14)

This chronological study of the appearance of ceramics in West Asia has several interesting outcomes. As noted in the introduction, there is a long period of experimentation with clay, during which vessels made from fired clay may have been developed repeatedly but not did not become widely adopted. This can be most clearly seen in the levels with clay vessels at Ganj Dareh which are dated as a short period of occupation belonging to the late 9th and early 8th millennia cal. BC. It has convincingly been argued, however, that these vessels were only accidentally fired (Le Mièrre and Picon 1998) so this precocious incidence of pottery belongs to the period when fired clay vessels were not being routinely manufactured.

In a region encompassing the Balikh valley, the upper Euphrates, the central and north Levant and Cilicia, there is a large amount of agreement in the likely date of the first regular appearance of pottery. Taken at one standard deviation, the date ranges for this event suggest a date of perhaps 6900–6850 cal. BC is possible for all sites. Of course, it is unlikely that pottery was adopted simultaneously within this zone. There is likely to have been a pattern of invention, imitation and emulation. However, it is not possible to use the presently available radiocarbon dates to establish a more fine grained sequence within this area and it is certainly credible that the spread of ceramics within this region may have happened quite rapidly.

Further north, the appearance of pottery at Çatalhöyük may have been contemporary or it may have been a little earlier. If the sequence between the Pre-XII phases and Phase XII is continuous at Çatalhöyük, it may imply that ceramics developed slightly earlier since the Pre-XII phases clearly date prior to 7,000 cal. BC.

In contrast, the dates from Tell Seker al-Aheimar and Salat Camii Yanı seem to indicate that the appearance of pottery in north east Syria and south east Turkey may have been 100–200 years later than sites further west. Although the Tell Seker al-Aheimar dates are a little earlier, pottery was already present when occupation started at Salat Camii Yanı so a slightly later date is not surprising. Although this discussion is primarily using the one standard deviation range, it should be noted that even at two standard deviations an overlap with sites further west is very unlikely. The best direct comparison is between Tell Seker al-Aheimar and Tell Sabi Abyad as, in both cases, ceramics appear within continuous and well dated sequences where date ranges are tightly constrained. At two standard deviations, the boundary between the last dated aceramic layer and the first dated ceramic layer at Tell Sabi Abyad is 7023–6841 cal. BC, while the

earliest boundary for the published Pre-Proto-Hassuna dates from Tell Seker al-Aheimar is 6882–6601 cal. BC. Although a minimal overlap does exist, the probability that the dated event at both sites lies in the necessary overlapping part of the range is less than 2.5%.

As Tell Seker al-Aheimar and Salat Camii Yanı are both dated using a large number of University of Tokyo AMS dates, it is not impossible that there is a systematic inter-laboratory error. This seems, however, unlikely and would be at the upper end of the errors found in the most recently documented inter-laboratory comparisons (Scott 2003). Apart from the laboratory's own quality control systems, comparisons between Tokyo dates and dates from other laboratories within this study do not suggest general problems.

<i>Cilicia, north Levant, upper Euphrates Valley and Balikh</i>	Date at 1 standard deviation, years cal. BC
Yumuktepe	6907-6656
Rouj Basin	After 7239-7051 and before 6399-6309
Akarçay Tepe	6952-6679
Mezraa Teleilat	After 6936-6756
Tell Halula	7108-6786
Shir	7090-6845
Tell Sabi Abyad	6976-6866
<i>South central Anatolia</i>	
Çatalhöyük	7047-6856
<i>North east Syria, south east Anatolia</i>	
Tell Seker al-Aheimar	6750-6700
Salat Camii Yanı	6602-6518
<i>Western Iran</i>	
Ganj Dareh	6215-6085
Ali Kosh	7526-7352

Table 12.13 Introduction of the routine manufacture of ceramic vessels.

In contrast, the dates for the start of ceramics in western Iran suggest that it was introduced significantly earlier. The recent dates from the Mohammed Jaffar phase at Ali Kosh suggest the appearance of pottery at 7526–7352 cal. BC and the dates from Teoe Guran also suggest ceramics were present prior to 7000 cal. BC.

Pottery only appears as a ubiquitous artefact somewhat later. Because of the lack of consistent quantitative data this is hard to date in the same way as the first appearances of pottery. Even with more consistent quantitative data, the question would remain one of definition, to be answered as much by the variety of contexts in which pottery was used as well as the absolute number or density of sherds. Nonetheless, as a starting point for further study, one might suggest

that this took place somewhere between 6,600 and 6,300 cal. BC in much of northern Mesopotamia and Anatolia, based on the date from Çatalhöyük (Level VIII), Yumuktepe (Phase XXX), the Rouj Basin (Phase 2c), Akarçay Tepe (Pottery Neolithic), Mezraa Teleilat (Phase IIB), Tell Sabi Abyad (Early Pottery Neolithic) and the Prot-Has-suna assemblages at Tell Seker al-Aheimar and Salat Camii Yanı.

Although the main focus of this article is on the northern part of West Asia, to gain a broader perspective it is useful to look briefly at comparisons with the southern Levant. It has usually been assumed that ceramics in the southern Levant began later than further north. The detailed and lengthy process of running chronological models for individual site sequences in the southern Levant lies outside the scope of this article. Instead a simpler model was used, following the classic PPNB, PPNC and Yarmukian sequence without sub-division and assuming that the phases do not overlap. The data is certainly not comprehensive and was collected from a range of sources, including existing personal databases and a survey of publications. In total, after removing a significant number of dates as being unlikely to refer to their apparent phase, 65 PPNB dates (including Ain Ghazal, Tell Ramad, Bawwab al-Ghazal, Nahal Issaron, Khirbet Hammam, Shu'eib, Jericho, Ba'ja and Divshon), 14 PPNC dates (including Ain Ghazal, Tell Ramad, 'Atlit, Labweh and Tel Ali) and 15 Yarmukian dates (including Shaar Hagolan and Nahal Issaron) were included. The resulting model had an overall index of agreement of 85%.

	1 standard deviation	2 standard deviations
Boundary between PPNB and PPNC	6511-6759	6913-6720
Boundary between PPNC and Yarmukian	769-6686	6811-6656

Table 12.14 Results a simple model for the start of pottery in the southern Levant.

This calibration confirms that the start of the Yarmukian is later than the earliest appearance of ceramics further north, and much earlier than the appearance of ceramics in western Iran. This is significant given the fact that in the southern Levant pottery appears sporadically during the aceramic Neolithic, just as further north. The potential for adoption of ceramic vessels as a regular technology, therefore, existed. Furthermore, early pottery is present at Shir in the central Levant so the potential for ceramics spreading through direct contact could also have existed. The failure of pottery to be adopted in the southern Levant was a question of cultural choice. Whatever context it had in the north, either as an material in its own right or as part of a wider pattern of consumption, did not exist in the southern

Levant.

The Yarmukian, however, appears to mark the widespread adoption of pottery, although in its early stages it remains hard to be sure just how common pottery was. Based on the simple chronological model presented above, the end of the PPNC and the start of the Yarmukian was 6769–6686 cal. BC. This probably places the widespread adoption of ceramics at about the same time as it happened in the north, again emphasising the extent to which these different stages in the adoption of ceramics should be treated distinct phenomena.

In conclusion, it may be worth drawing on the different ways that were suggested earlier in which the question could be framed. There was a long period during which clay was used for vessels, along with other objects, and may sometimes have been fired. This phase may have started in the 10th millennium cal. BC or even earlier. Although the potential for ceramics to come into wider use existed, it was not exploited, presumably because it did not have a social context in which it could become established. We might imagine multiple innovations, each of which may have persisted for some time, but they were isolated and they did not become part of a wider phenomenon.

Pottery became a more regular part of material culture at different points across West Asia. Although many of the details remain to be explored, some of the dynamics are starting to emerge. They remain fragmentary and often disconnected, and that is perhaps to be expected. In some areas, such as the northern Levant, Cilicia, the Euphrates valley and the Balikh, there may have been a single phenomenon, perhaps related to the spread of specific items and new patterns of food preparation and consumption, both possibly linked to new ways of displaying and establishing status. Other areas probably followed different narratives and ceramics were adopted, either through reinvention of what may by then already have been a familiar potential technology or through adoption from neighbouring regions.

The transformation of ceramic vessels from specific contexts, in which they had particular value, to the ubiquitous technology, probably manufactured within every household and utilised for a myriad of tasks was a further step, which again may have had several stimuli. It is notable that, on present evidence, this may have had a shorter chronology over a wider region than the initial establishment of ceramics. It was not, however, inevitable. While on the mainland pottery was moving to the ubiquitous material familiar to prehistorians, it still did not gain traction in other locales. In Cyprus, pottery was not adopted until much later. Although the chronology will not be examined here, there is evidence that ceramic technology,

in the form of isolated low-fired sherds, was known by at least the 7th millennium cal. BC (Clarke 2010: 200). The Cypriot Neolithic, however, remained aceramic until the first half of the fifth millennium cal. BC (Clarke 2010). The adoption of ceramics was not inevitable and needs to be understood on a local as well as a general level as a series of primarily social rather than technological phenomena.

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Chapter 13

The Beginning of Pottery Technology in Japan: The Dating and Function of Incipient Jomon Pottery

Yasuhiro Taniguchi

Introduction

In 1998, the author instituted an inquiry about the origin of pottery in Japan through an excavation at the Odai Yamamoto 1 site, in the most northern part of Japan's main island, Honshu. 46 small sherds of plain pottery were discovered together with Mikoshiba-Chojakubo type stone implements, known from the transition from the Palaeolithic to the Jomon period. The calibrated ^{14}C dates from charcoal on the surface of the excavated pot sherds were c.16,000 cal. BP and the fact that pottery had originated during the Last Glacial stage of the Pleistocene Era came to light (Odai Yamamoto 1 site excavation team 1999; Taniguchi and Kawaguchi 2001). It is now apparent that pottery use had begun by that time in Japan, and that Japan – and neighbouring areas of East Asia – is one of the oldest cradles of pottery culture. However, the reasons why pottery emerged during the Last Glacial stage in this region and how the beginning of pottery technology brought about cultural change are both still unclear.

In order to solve this important problem, it is necessary to confirm the age of the earliest pottery and to analyze the way it was actually used. We need to (1) establish a solid chronological sequence of pottery types, (2) acquire accurate dates for this sequence, (3) determine the functions of the vessels, (4) evaluate the frequency of pottery use by individual site and (5) match the pottery sequence with environmental fluctuation. Evaluating the functions of pottery in daily life and change over time should help us understand more about the end of Palaeolithic culture and the formation of Jomon culture. Under this premise, our team has been exploring Incipient Jomon sites for many years and has just initiated an excavation of peat bogs at the Unoki site in Niigata Prefecture.

In this paper, I will provide an overview of the study of the dating and function of the earliest pottery in Japan and indicate some fundamental issues.

The chronology of 'Incipient Jomon' pottery

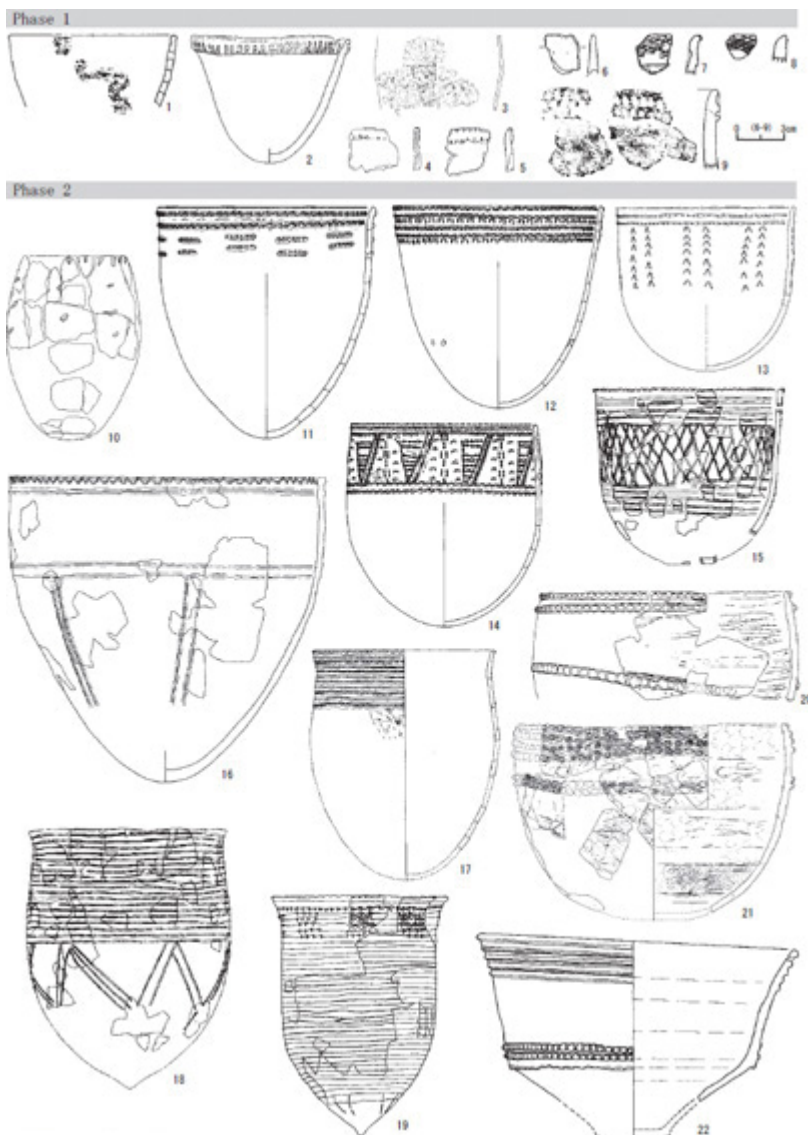
From the 1960s, many types of pottery called 'Incipient Jomon' were discovered one after another, and their chronological sequence was established based on stratigraphy and typology. Incipient Jomon pottery in Japan evolved through three phases, as follows (Otsuka 1989; Taniguchi 2002b: Fig. 13.1–13.2):

Phase 1: pre-Linear-relief potteries

Phase 2: Linear-relief pottery

Phase 3: post-Linear-relief potteries

The oldest pottery in Japan (Phase 1) is mostly plain ware. Potsherds excavated from the Odai-Yamamoto 1 site – the oldest example in Japan – are undecorated. False puncture pottery and incised line pottery were also discovered at a few sites. The number of known sites from this phase is not more than 20: most sites have been discovered in eastern and northern Japan, from the Kanto region to Hokkaido. There are a few sites in Kyushu thought to date to this phase, but their dating and pottery types are uncertain. The quantity of excavated potsherds from individual sites is almost always very small, so the forms of vessels are unclear: known forms include examples of flat rims, flat bases and round bases. It is known that fibre tempering techniques were occasionally used.



1-9: Phase 1 10-22: Phase 2 1:Maeda-Kouchi(Plain) 2:Musyagatani(False puncture) 3:Jin Lower(Plain) 4-5:Sagami 149(False puncture) 6:Odai Yamamoto (Plain) 7-8:Tama NT.796(Incised line) 9:Terao Layer(False puncture) 10:Senpukuji Cave(Bean-shaped relief) 11-14:Hanamiyama(Linear relief) 15:Kamino Layer (Linear relief) 16:Kubodera-minami(Linear relief) 17:Tsukidematsu(Linear relief) 18:Himizo(Linear relief) 19:Omotedate 1(Linear relief) 20:Okunonita(Linear relief) 21:Sankakuyama(Linear relief) 22:Shikazegashira(Linear relief)

Fig.13.1 Pottery of the Incipient Jomon period in Japan (Phases 1–2), Scale = 1:6.



Fig.13.2 Pottery of the Incipient Jomon period in Japan (Phase 3). Scale = 1:6.

Linear-relief pottery marks the second phase of the Incipient Jomon period. There are several varieties of linear-relief decoration, distinguished on the basis of thickness, notch on ridge and pattern. The bean-shaped relief on the oldest vessels from Sempukuji Cave in Nagasaki Prefecture is also thought to comprise a further type. Vessel shapes are also varied: pointed and flat bases both occur. Larger size vessels (over 30 cm rim diameter) are occasionally seen. Linear-relief pottery is distributed over a broad area across the Japanese

archipelago, from the Satsunan Islands south of Kyushu to central Hokkaido. And the number of sites evidently increased over time. Some regional differences in pottery types are noted. Especially in southern Kyushu, very distinctive types with thick clay ridges are known.

The third phase of the Incipient Jomon period has several pottery types: (1) finger nail-like impression, (2) pitted decoration, (3) impressed cord mark and (4) rolled cord mark are preponderant. These types are mainly distributed in central, eastern and northern Japan and developed roughly in this sequence in the region. A few other patterns of decoration are seen occasionally. In western Japan, the later three types are seldom discovered. Regional variation in pottery types occurs to some extent. In southern Kyushu, big nail-shaped punctate pottery developed from the former clay ridge type. Vessel forms are varied, and there is considerable diversity in size. A unique vessel form with a basket-model roundish-square flat base often occurs in the cord marked pottery called 'Muroya lower-layer type' in the latter half of Phase 3.

After Phase 3, the Yoriito-mon (roller pattern made using a cord-coiled stick) and Oshigata-mon (roller pattern made using a carved stick) pottery appeared at the beginning of the Earliest Jomon period. One characteristic of this phase is that several kinds of roll-impressed patterns became the dominant mode in pottery decoration. On the other hand, regional variation in pottery types became pronounced during this phase: the Oko-Jinguji type Oshigata-mon pottery in western Japan, the Hizawa type Oshigata-mon pottery in central Japan and the Yoriito-mon pottery in eastern Japan (with pottery still uncommon in northern Japan). The vessel forms are standardized: all have wide flat rims and round or pointed bases. The frequency of pottery use was greatly expanded, except in the case of northern Tohoku and Hokkaido.

¹⁴C dates for Incipient Jomon pottery

At present, ¹⁴C dating for Incipient Jomon pottery is proceeding well; the growing use of the AMS technique has greatly refined the dating of this early pottery chronology. There presently are 118 reliable ¹⁴C dates for these early pottery types from 41 sites: 11 for Phase 1, 42 for Phase 2, and 65 for Phase 3 (Taniguchi 2002b; 2004; 2005; Keally et al. 2003; Kobayashi 2007; Table 13.1).

The dates effectively match the relative chronological sequence mentioned above. To provide a tentative estimate of the central age and range of the three phases, the mean value and standard deviation

for the dates of each phase are calculated as follows:

Phase 1: $13,104 \pm 310$ BP (n = 11)

Phase 2: $12,319 \pm 536$ BP (n = 42)

Phase 3: $11,161 \pm 882$ BP (n = 65)

The values roughly indicate that the midmost ^{14}C ages of the three phases are thought to be: Phase 1: c.13,400–12,800BP; Phase 2: c.12,800–11,800BP; and Phase 3: c.12,000–10,300BP.

The ^{14}C calibration curve for this range is still not entirely reliable: nevertheless, the age of Incipient Jomon pottery can be effectively inferred. Calibrated with *intcal04* using *CalPal_A2007* (Weninger et al. 2007), these ages, quoted at one standard deviation, are:

Phase 1: $15,510 \pm 430$ cal. BP

Phase 2: $14,470 \pm 690$ cal. BP

Phase 3: $12,940 \pm 1160$ cal. BP

Based on the calibrated ^{14}C ages above, the probable age of each phase is thought to be: Phase 1: c.15,900–15,100 cal. BP; Phase 2: c.15,200–13,800 cal. BP; and Phase 3: c.14,100–11,800 cal. BP. The full *The Beginning of Pottery Technology in Japan: The Dating and Function of Incipient Jomon Pottery* range of these dates falls roughly between 16,000 and 11,500 cal. BP ([Fig. 13.3](#)). That is apparently parallel with the Late Glacial substage, i.e. the end of the Pleistocene Era. And the succeeding initial Earliest Jomon pottery is well dated to later than 11,500 cal. BP, that is contemporaneous with the beginning of the Holocene Era.

Site	Phase	Pottery	Lab. No.	Method	Material	¹⁴ C Age [BP±1σ]	Calibrated Date [cal BP]
Odai Yamamoto I	1	Plain	NUTA-6510	AMS	adhesion	13,780±170	16,650-16,170
Odai Yamamoto I	1	Plain	Beta-125550	AMS	charred wood	13,480±70	16,150-15,890
Odai Yamamoto I	1	Plain	NUTA-6515	AMS	adhesion	13,210±160	15,890-15,410
Odai Yamamoto I	1	Plain	NUTA-6507	AMS	adhesion	13,030±170	15,670-15,190
Odai Yamamoto I	1	Plain	NUTA-6509	AMS	adhesion	12,720±160	15,190-14,610
Odai Yamamoto I	1	Plain	NUTA-6506	AMS	adhesion	12,680±140	15,110-14,570
Kitahara	1	Plain	Beta-105398	AMS	charred wood	13,060±80	15,580-15,300
Kitahara	1	Plain	Beta-105401	AMS	charred wood	13,060±100	15,600-15,280
Kitahara	1	Plain	Beta-105400	AMS	charred wood	13,050±80	15,560-15,280
Kitahara	1	Plain	Beta-105403	AMS	charred wood	13,050±80	15,560-15,280
Kitahara	1	Plain	Beta-105402	AMS	charred wood	13,020±80	15,530-15,250
Tokumaru Nakata	2	Linear relief	PAL-381	β-ray	wood	13,700±560	17,190-15,550
Tokumaru Nakata	2	Linear relief	PAL-383	β-ray	wood	12,770±225	15,340-14,560
Tokumaru Nakata	2	Linear relief	PAL-384	β-ray	wood	12,420±205	14,850-14,170
Tokumaru Nakata	2	Linear relief	PAL-380	β-ray	wood	12,410±225	14,860-14,140
Torihamo	2	Linear relief	KSU-1028	β-ray	wood	11,830±55	13,770-13,610
Tokumaru Nakata	2	Linear relief	PAL-379	β-ray	wood	11,810±240	13,940-13,440
Torihamo	2	Linear relief	KSU-1029	β-ray	wood	11,800±55	13,750-13,570
Tokumaru Nakata	2	Linear relief	PAL-382	β-ray	wood	11,550±235	13,660-13,220
Torihamo	2	Linear relief	IAAA-30476	AMS	wood	11,220±80	13,200-13,020
Gotenyama	2	Linear relief	Beta-196087	AMS	adhesion	13,560±40	16,240-16,020
Gotenyama	2	Linear relief	MITC-05108	AMS	charred wood	13,200±70	15,770-15,490
Kannoki	2	Linear relief	PLD-1844	AMS	adhesion	13,010±110	15,560-15,220
Kannoki	2	Linear relief	PLD-1845	AMS	adhesion	12,870±110	15,890-15,410
Fukui Cave Layer III	2	Linear relief	Gak-950	β-ray	charred wood	12,700±500	15,610-14,190
Kubodera Minami	2	Linear relief	TKA-14586	AMS	adhesion	12,690±110	15,110-14,690
Kubodera Minami	2	Linear relief	TKA-14587	AMS	adhesion	12,670±170	15,120-14,480
Kubodera Minami	2	Linear relief	Beta-140495	AMS	adhesion	12,630±50	15,000-14,740
Kubodera Minami	2	Linear relief	Beta-136746	AMS	adhesion	12,620±50	14,990-14,710
Kubodera Minami	2	Linear relief	Beta-140494	AMS	adhesion	12,520±50	14,850-14,430
Kubodera Minami	2	Linear relief	Beta-136747	AMS	adhesion	12,510±40	14,830-14,430
Kubodera Minami	2	Linear relief	Beta-136745	AMS	adhesion	12,490±60	14,800-14,360
Kubodera Minami	2	Linear relief	TKA-14598	AMS	adhesion	12,460±90	14,780-14,300
Kubodera Minami	2	Linear relief	Beta-136744	AMS	adhesion	12,420±50	14,650-14,270
Kubodera Minami	2	Linear relief	Beta-136743	AMS	adhesion	12,280±50	14,320-14,080
Kamino 2	2	Linear relief	Beta-158196	AMS	adhesion	12,480±50	14,780-14,360
Nakajima B	2	Linear relief	I-13767	β-ray	charred wood	12,460±310	15,010-14,110
Sekio Sanso B	2	Linear relief	Beta-133847	AMS	adhesion	12,340±50	14,500-14,160
Sekio Sanso B	2	Linear relief	Beta-133849	AMS	adhesion	12,160±40	14,090-13,950
Sekio Sanso B	2	Linear relief	Beta-133848	AMS	adhesion	12,000±40	13,940-13,800
Manpukui No.1	2	Linear relief	Beta-191840	AMS	adhesion	12,330±40	14,450-14,150
Kamikuroiwa Layer IX	2	Linear relief	I-944	β-ray	charred wood	12,165±600	15,070-13,570
Nakamati	2	Linear relief	IAAA-40496	AMS	adhesion	11,990±60	13,940-13,780
Sikazegashira	2	Linear relief	Beta-118963	n/a	adhesion	11,860±50	13,790-13,670
Sikazegashira	2	Linear relief	Beta-118964	n/a	adhesion	11,780±50	13,720-13,540
Keio SFC	2	Linear relief	Gak-15904	β-ray	charred wood	11,350±160	13,380-13,080
Higashi Kurotsuchi	2	Linear relief	n/a	n/a	nut shell	11,300±130	13,300-13,060
Kamikuroiwa Layer VIIc	2	Linear relief	MITC-04312	AMS	charred wood	12,420±60	14,670-14,270
Kamikuroiwa Layer IV	2	Linear relief	Beta-201260	AMS	charred wood	12,530±40	14,860-14,480
Onigano	2	Linear relief	Beta-177290	AMS	adhesion	12,180±40	14,110-13,970

Onigano	2	Linear relief	Beta-177289	AMS	adhesion	11,880±60	13,820-13,680
Sankakuyama I	2	Linear relief	MTC-05834	AMS	adhesion	12,080±70	14,030-13,850
Komayama B	2	Linear relief	TKa-14554	AMS	adhesion	11,940±50	13,880-13,740
Nakamachi	3a	Nail impression	Gak-9624	β-ray	charcoal	12,740±380	15,500-14,340
Nakamachi	3a	Pitted decoration	PLD-1843	AMS	adhesion	12,280±110	14,530-14,050
Nakamachi	3a	Pitted decoration	PLD-1840	AMS	adhesion	12,200±120	14,360-13,940
Nakamachi	3a	Pitted decoration	PLD-1842	AMS	adhesion	12,040±110	14,030-13,790
Nakamachi	3a	Pitted decoration	PLD-1839	AMS	adhesion	12,010±130	14,020-13,760
Nakamachi	3a	Pitted decoration	PLD-1841	AMS	adhesion	11,770±120	13,760-13,480
Nakamachi	3a	Nail impression	Gak-9625	β-ray	charcoal	10,550±270	12,730-11,950
Taisho 3	3a	Nail impression	Beta-194629	AMS	adhesion	12,420±40	14,640-14,280
Taisho 3	3a	Nail impression	Beta-194626	AMS	adhesion	12,380±40	14,560-14,220
Taisho 3	3a	Nail impression	Beta-194628	AMS	adhesion	12,330±40	14,450-14,150
Taisho 3	3a	Nail impression	Beta-194627	AMS	adhesion	12,200±40	14,140-14,000
Taisho 3	3a	Nail impression	Beta-194630	AMS	adhesion	12,180±40	14,110-13,970
Taisho 3	3a	Nail impression	Beta-194631	AMS	adhesion	12,100±40	14,020-13,880
Fukui Cave Layer II	3a	Nail impression	Gak-949	β-ray	charred wood	12,400±350	14,990-14,010
Kiwada	3a	Nail impression	Beta-148515	β-ray	charred wood	12,360±50	14,550-14,190
Nozawa	3a	Plain	IAAA-10050	AMS	charred wood	11,860±50	13,790-13,670
Nozawa	3a	Plain	IAAA-10650	AMS	charred wood	11,830±50	13,760-13,620
Nozawa	3a	Plain	IAAA-10048	AMS	adhesion	11,820±50	13,750-13,610
Nozawa	3a	Plain	IAAA-10047	AMS	adhesion	11,760±50	13,700-13,520
Nozawa	3a	Plain	IAAA-10053	AMS	charred wood	11,760±50	13,700-13,520
Nozawa	3a	Plain	IAAA-10648	AMS	charred wood	11,750±40	13,700-13,520
Nozawa	3a	Plain	IAAA-10049	AMS	charred wood	11,750±50	13,690-13,510
Nozawa	3a	Plain	IAAA-10052	AMS	charred wood	11,710±50	13,660-13,480
Nozawa	3a	Plain	IAAA-10051	AMS	adhesion	11,390±50	13,310-13,210
Nozawa	3a	Plain	IAAA-10649	AMS	charred wood	10,380±40	12,370-12,150
Jin	3a	Pitted decoration	TKa-14552	AMS	adhesion	11,800±60	13,740-13,560
Jin	3a	Pitted decoration	TKa-14594	AMS	adhesion	11,700±90	13,670-13,450
Saigura	3a	Nail impression	TKa-14358	AMS	adhesion	11,760±120	13,740-13,480
Saigura	3a	Nail impression	TKa-14584	AMS	adhesion	11,570±80	13,540-13,340
Saigura	3a	Nail impression	TKa-14551	AMS	adhesion	11,550±60	13,480-13,320
Unoki Minami	3a	Nail impression	Beta-136742	AMS	adhesion	11,630±50	13,580-13,400
Unoki Minami	3a	Nail impression	Beta-136741	AMS	adhesion	11,130±50	13,100-12,980
Unoki Minami	3a	Nail impression	Beta-136740	AMS	adhesion	11,040±50	13,040-12,920
Unoki Minami	3a	Nail impression	Beta-136739	AMS	adhesion	11,000±50	13,010-12,890
Kuzuharazawa IV	3a	Cord-impressed	Gak-18194	β-ray	charred wood	11,400±140	13,410-13,150
Iwashita Cave	3a	Nail impression?	SI-503	β-ray	charcoal	11,300±130	13,300-13,060
Nakata D	3a	Plain	TKa-14556	AMS	adhesion	11,610±50	13,560-13,380
Nakata D	3a	Nail impression	TKa-14588	AMS	adhesion	11,340±120	13,330-13,110
Saishikada Nakajima	3a	Nail impression	Beta-130326	β-ray	clay	11,180±40	13,150-13,010
Saishikada Nakajima	3a	Cord-impressed	Beta-128025	AMS	charcoal	10,070±70	11,800-11,440
Oshikakubo	3a	Cord-impressed	Beta-167428	AMS	charred wood	10,850±40	12,890-12,830
Ozakashimizu	3a	Punctate pattern	TKa-14596	AMS	adhesion	10,740±110	12,850-12,630
Ozakashimizu	3a	Punctate pattern	TKa-14597	AMS	adhesion	10,670±140	12,800-12,420
Kosegasawa	3a	Nail impression	TKa-14564	AMS	adhesion	10,510±60	12,640-12,380
Takihata	3a	Nail impression	Beta-138898	AMS	charcoal	10,260±40	12,100-11,880
Torihama	3a	Nail impression	KSU-1027	β-ray	wood	10,770±160	12,880-12,500
Torihama	3a	Nail impression	KSU-1017	β-ray	wood	10,290±45	12,220-12,000
Shirasawa	3a	Nail impression	Beta-163737	AMS	adhesion	9,410±50	10,700-10,580
Shirasawa	3a	Nail impression	Beta-163735	AMS	adhesion	9,080±60	10,340-10,200
Juno peat	3	Scraped	I-12229	β-ray	wood	11,270±170	13,380-12,980

Juno peat	3	Scraped	Gak-10668	β -ray	wood	11,270 $\pm$ 230	13,310-13,010
Obaru D	3	Scraped	Beta-89468	AMS	charcoal	10,840 $\pm$ 90	12,900-12,800
Obaru D	3	Scraped	Beta-89469	AMS	charcoal	10,760 $\pm$ 70	12,850-12,730
Senpukuji Cave	3	Scraped	KSU-276	n/a	soil	10,300 $\pm$ 200	12,480-11,680
Torihama	3b	Cord-rolled	KSU-404	β -ray	wood	10,320 $\pm$ 45	12,310-12,050
Torihama	3b	Cord-rolled	KSU-1025	β -ray	wood	10,270 $\pm$ 45	12,150-11,910
Torihama	3b	Cord-rolled	KSU-1026	β -ray	peat	10,130 $\pm$ 45	11,920-11,640
Torihama	3b	Cord-rolled	KSU-397	β -ray	wood	10,080 $\pm$ 60	11,810-11,470
Torihama	3b	Cord-rolled	KSU-1016	β -ray	wood	10,070 $\pm$ 45	11,760-11,460
Kushibiki	3b	Cord-rolled	Beta-113349	AMS	charcoal	10,030 $\pm$ 50	11,680-11,400
Kamikuroiwa Layer VI	3b	Plain	I-943	β -ray	charred wood	10,085 $\pm$ 320	12,300-11,260
Sendai Uchimaie	3b	Plain	NUTA-604	AMS	charcoal	9,750 $\pm$ 100	11,240-10,900
Sendai Uchimaie	3b	Plain	NUTA-605	AMS	charcoal	9,590 $\pm$ 100	11,110-10,770
Shiroijyuni	3b	Cord-rolled	PLD-7800	AMS	adhesion	10,115 $\pm$ 39	11,900-11,620
Shiroijyuni	3b	Cord-rolled	PLD-7801	AMS	adhesion	9,977 $\pm$ 39	11,570-11,330

Notes

- 1) Ages were calculated using the 5568 years half-life and are given as years BP (years before 1950). The standard deviation ($\pm$) is one sigma.
- 2) The calibration curve used is *intcal04* with *CalPal_A* (Weninger, Olaf & Danzeglocke 2007). Calibrated dates are given as cal BP. The calibration date range is based on 1σ (68.2% probability). The calibration of dates is based on conventional ^{14}C ages.

Table 13.1 ^{14}C ages and calibrated dates for Incipient Jomon pottery in Japan.

Estimating the function of the earliest pottery

The function of the earliest pottery is still unclear because research on the uses of pottery in the Incipient Jomon period has been insufficient. In order to understand early pottery use, it is necessary to gather additional evidence and data: (1) use/wear observed on pottery (soot, water lines, burn marks etc.); (2) vessel form and capacity of pots; (3) quantity (consumption) of potsherds excavated; (4) ^{13}C / ^{15}N measurement of carbonized adhesions derived from cooked or processed materials in the pottery; (5) food remains; (6) site location where pottery was used; (7) the vegetation and ecosystem surrounding the site; (8) cultural context, etc. Integrating this fragmentary information, we should consider hypothetically how human beings adapted their culture and technology to the environmental changes through the Pleistocene-Holocene transition, and discover why pottery was required.

It is a tangible fact that, in most cases, the earliest Japanese pottery was used for boiling. Reconstructed pots show that most vessels had wide flat rims and deep bowls. Round and pointed bases dominate over flat bases. Such vessel forms are appropriate for boiling or cooking, but not for storing. There are no pots with a narrow neck. The carbonized adhesions, soot and secondary burning seen on many pot sherds suggest a major function of pottery in the three phases was boiling foods or other organic materials. Although there is no primary evidence of what was cooked or processed in the pottery, the probability of some cooking use is most high in every phase. The $\delta^{13}\text{C}$

values for carbonized adhesions on the earliest pottery mostly fall between -24‰ and -25‰: equivalent to the values of C3 plants (Taniguchi 2005). The existence of holes drilled in the vessel wall for repairing a cracked pot, however, indicate that some pots were used for other purposes, possibly for storage.

However, focusing on the quantities of potsherds from individual sites, the frequency of pottery use does not actually seem to have been so great. Strictly speaking, it is very difficult to determine and compare the quantity of pottery from each site, but this would make a good index to evaluate the development of pottery use. During the three phases of the Incipient Jomon period, the quantities of excavated pot sherds are generally very low (Fig. 13.4).

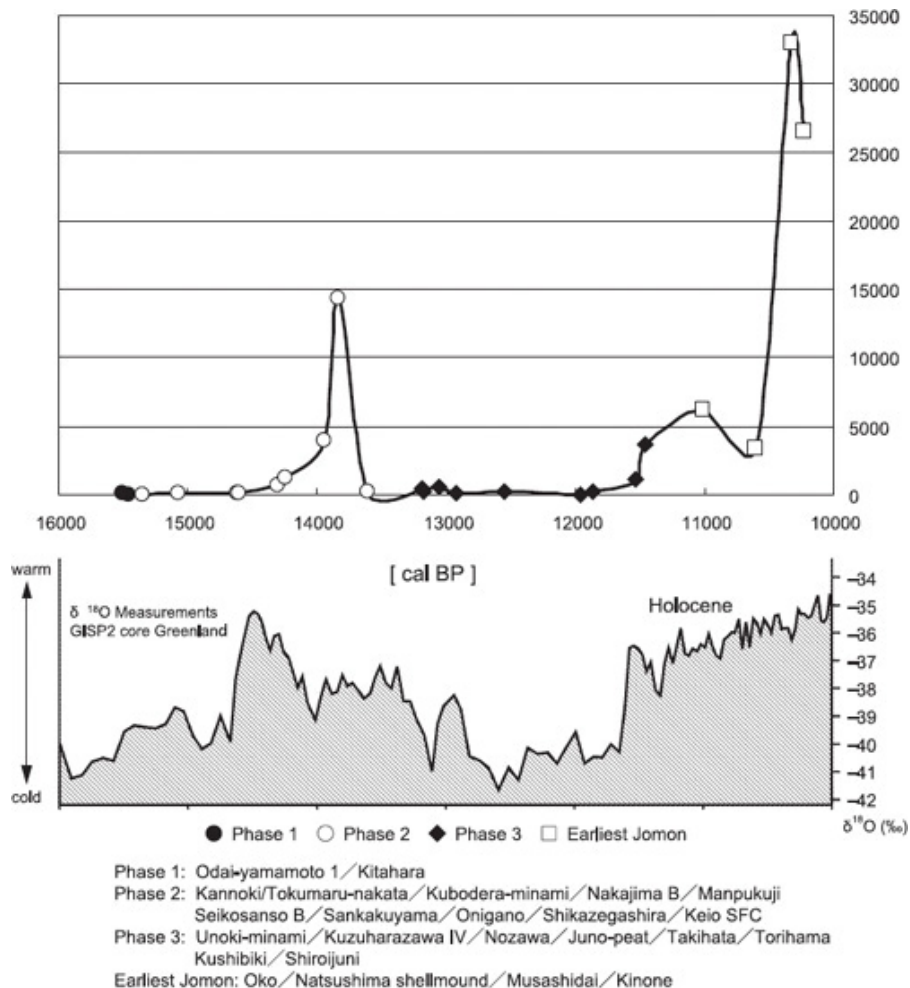


Fig.13.4 Temporal changes in potsherd quantities of early pottery in Japan.

In Phase 1, the quantities of pot sherds found in each site remained extremely low – a small handful, and many contemporary sites yield no pottery. In Phase 2, it can be inferred that pottery use became comparatively widespread, because (1) the number of sites with pottery increased (except in Hokkaido), (2) the sites extended their location across several eco-zones, from riverside lowland to high mountain cave, (3) the forming technique of pottery developed somewhat and (4) the capacity of vessels tended to become larger. The quantities also show a tendency to increase. Especially in southern Kyushu, some sites yield a few hundred or even thousands of potsherds. For example, the Sankakuyama site in Tanegashima island of Kagoshima Prefecture yielded more than 5,000 pot sherds, and 1,600 pieces or so from the neighbouring Shikazegashira site include a reconstructed pot with a rim diameter over 50 cm (the largest known

to date). But in Phase 3, by contrast, a decrease in pottery quantities occurred. At the same time, the walls of pottery vessels tended to become extremely thin, particularly in eastern and northern Japan.

Correlation with climate change in the Pleistocene-Holocene transition

To interpret the context in which the early pottery culture could not develop favourably, it is necessary to explore the relationship between the development of pottery culture and environmental fluctuation.

Correlating with climatic change traced in the GISP2 isotope stages and the Scandinavian pollen zone (Stuiver et al. 1995), the three phases of the Incipient Jomon period are roughly placed as follows: Phase 1 precedes the Oldest Dryas colder period and also correlates with a colder glacial climate in Japan. Phase 2 correlates roughly with the Bølling and Allerød warmer periods. And Phase 3 correlates with the Younger Dryas colder period.

The increase in the quantities of pottery seen in Phase 2 is thought to correlate with the increase and spread of deciduous oak forest in Japan, from Kyushu to Honshu (Tsuji 1997). A major function of pottery in this phase was probably processing acorns or other plant foods. Circumstantial evidence includes the existence of large stone querns, pit depots of acorns, and subterranean built-in fire places. Pottery use was already familiar to some degree, being most popular in the Temperate Forest Zone. On the other hand, the slackening in growth seen in Phases 1 and 3 suggests that some factor in the colder climate affected and limited pottery use in daily life. The variation in quantities of pottery from sites, and their correlation with changes in climate, suggest some limited and occasional function during the more than 4,000 years of the Incipient Jomon period: a function or functions quite different from those of the later Jomon phases. These functions must have been related to the nomadic life style common at that time; pit dwellings and sedentary settlements were still rare.

The explosive increase in pottery quantities marked an epoch-change recognized as the beginning of the Earliest Jomon period (Phase 4): this exactly correlated with the beginning of the Holocene Era. Under conditions of global warming, deciduous oak (*Fagus Linn.*, *Lepido balanus Endi.* etc.) and Japanese chestnut (*Castanea Crenata Sieb. et Zucc.*) came to dominate forests from Kyushu to Honshu. The appearance of sedentary settlements and shell-mounds was also an important related change. Within such natural and cultural contexts, pottery use eventually became more mature and essential to culture: no less than what we recognize as the establishment of Jomon culture.

Conclusion

Pottery was clearly in use in the Japanese archipelago before the end of the Last Glacial stage, since ca. 16,000 cal. BP. However, the frequency of pottery use remained at a low level and its function is thought to have remained limited, probably for processing acorns or other plants. Although pottery technology was probably an essential adaptation to the environmental fluctuation of the Pleistocene-Holocene transition, we cannot overestimate its function and effect toward cultural innovation. Rather, over the 4,000 years of the Incipient Jomon period, there seems to have been a long process during which the potential of pottery was explored. With the beginning of the Holocene Era, pottery became an integral and necessary element of Jomon culture: for leaching acorns, for daily cooking and for many other uses. Furthermore, after this time, the adornment of pottery gradually developed beyond function and Jomon pottery became an important medium of collective representation in non-literate Jomon societies.

The theory that the beginning of pottery technology marks the end of the Palaeolithic and the emergence of the Neolithic has been predominant for many years (cf. Chard 1974; Barnes 1999; and others). But from the viewpoint of current research in Japan and neighbouring East Asia (Wu and Zhao, 2003) this supposition is no longer acceptable. Since the earliest pottery culture lasted a few thousand years in the Last Glacial stage of the Pleistocene Era, it would best be distinguished from subsequent Neolithic cultures.

In Japan, most archaeologists similarly determine the beginning of the Jomon period by the The Beginning of Pottery Technology in Japan: The Dating and Function of Incipient Jomon Pottery emergence of pottery. This also requires reconsideration based on the actual circumstances and age of the earliest pottery. The other typical elements of Jomon culture (sedentary settlements, shell-mounds, clay figures etc.) had not yet come into existence by that time. Changes toward the formation of the Jomon culture were not revolutionary but gradual, depending on environmental conditions. Whenever we discuss the meaning of the beginning of pottery in that process, it is necessary to understand that it took more than 4,000 years from the emergence of pottery technology to the establishment of the Jomon culture. My stance on this issue re-defines the period called 'Incipient Jomon' as the long-term process of Palaeolithic-Jomon transition (Taniguchi 2002a).

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Chapter 14

Synthesis: The Emergence of Pottery in West Asia

Olivier Nieuwenhuyse and Stuart Campbell

Introduction

The Tsukuba conference on the *Emergence of Pottery in West Asia* was in many ways a unique occasion. It was the first time such a large group of dedicated specialists gathered to discuss when, where, how and why ceramics were first introduced in Neolithic societies in West Asia. Arguably, for the first time they were able to do this on the basis of a rich data set now emerging from the field, rather than the patchy, fragmented, selective data that had always formed the specialist's playing ground. Over the past fifty years or so early pottery complexes in the wider region have hardly ever been investigated in their own right. As reported by Marie Le Mièrè in her several syntheses (Le Mièrè 2000, 2001, 2007; Le Mièrè and Picon 1987, 1991, 2003; Picon and Le Mièrè 1998), early ceramics have often been unexpected by-products of projects focussing upon much earlier aceramic periods or on later prehistoric periods. This has changed. The past decade has seen a tremendous increase in research in various parts of West Asia focusing explicitly on this theme. As the papers and ensuing discussions at the conference testified, we have come a long way in a short time. There was much to discuss. The participation by scholars specializing in the early adoption of pottery in East Asia (Taniguchi, this volume) provided a valuable comparative perspective on the West Asian discoveries.

Nonetheless, when the organizers of the conference suggested that one of the authors (O.N.) prepare a 'synthesis', it was clear that this might be a challenge. For, if elements of a 'broader picture' now certainly seem to be emerging (see the contributions by Tsuneki, this volume, chapter 1; Le Mièrè, this volume), it is also obvious that scholars differ widely in their methodological approaches, the paradigms within which they choose to work, the parameters they wish to emphasize and the regional scope they endorse. To be sure, this diversity proved to be very stimulating, contributing much to the lively dynamism that characterized the discussions. Yet it sometimes became apparent that the only consensus at this stage is that we

disagree on almost everything! Some broad patterns are certainly moving into focus, but it is clear that a significant level of uncertainty remains. Nor is the evidence at this point as solid as we might wish. The group acknowledged that, in spite of all the recent progress, huge parts of the region remain very poorly represented. The number of sites documenting a local transition from Pre-Pottery Neolithic into Pottery Neolithic remains tantalizingly low. Much of the newly available data set has so far been made available only in preliminary fashion; it needs to be explored much further to sink in and become part of the archaeological mainstream. A vast amount of archaeometrical and contextualizing work lies ahead of us. One might even believe the conference was premature: a 'Tsukuba-2' two decades down the road may be very rewarding.

As important as what was discussed at the meeting was perhaps what was not discussed. Although a wide range of specialists were indeed present, there was a concentration on northern Mesopotamia. This was a deliberate choice, as it is in this region where many of the recent discoveries have been made, but it may bias the perspectives presented in this volume. Other areas were unrepresented, including locations where ceramics appear at least as early, such as central Anatolia. Although general adoption of ceramics seems to have been later in the southern Levant and Cyprus, as it becomes clearer that the use of pottery was much more a process than an event, it will become critical to consider a much wider regional pattern of experimentation, adoption and resistance. Indeed we are only starting to see the definition of the appropriate frames in time and space within which to study this phenomenon. Amongst other outcomes, it is a valuable role for the Tsukuba meeting if it has helped to highlight areas which need to be included in the discussion and perhaps help to find new questions that demand new answers.

Landmark conferences bring together unfamiliar data and make these available outside the tiny circle of specialists, they stimulate participants to search for conceptual cross-linkages and synthesis, pushing them to think outside the box and explore new horizons. We believe 'Tsukuba 1' achieved these goals marvellously. Paul Bahn once cogently observed that "trying to reconstruct shattered pots is a frustrating and delicate task – those who do not wish to be thrown by making a slip need an even temper" (Bahn 1995: 25). As it is widely known that West Asian prehistorians have rather even tempers (well, most of them) we may reasonably expect much progress in the near future. To contribute to this, we take as our starting point the helpful summary offered by the organizer (Tsuneki, this volume, chapter 1) to

briefly reflect on the various presentations, asking some questions we believe may offer fruitful avenues for further work.

So, as we now know the pottery was adopted as a consistent component of material culture between c.7000 and 6600 cal. BC across much of Upper Mesopotamia and the Northern Levant, initially characterized by low amounts of mineral-tempered, well-crafted and visually conspicuous pottery containers that appear to have facilitated, amongst others, activities involving the preparation of food and drink with fire. It was only after several more centuries, starting around c.6600 cal. BC, that people moved to making increasing amounts of pottery containers, shifting to the production of the coarsely-made plant-tempered wares that we had once interpreted as the oldest pottery in the region. Each of these new insights immediately poses new questions. We shall discuss some of the elements on which the group reached a broad consensus, which refer to the main question posed at the beginning of the workshop: when, where, how and why did pottery first arrive in West Asia?

Pottery and archaeological meta-narratives

One of the intriguing questions posed at the conference was why it has taken scholarship so long to turn the investigation of the adoption of pottery containers in ancient West Asia into a concerted goal for research. Intriguing, because pioneering work by the Braidwoods in the Zagros (Braidwood et al. 1983; Braidwood and Howe 1960) and the Northern Levant (Braidwood and Braidwood 1960) and by the large community of prehistorians active in the Southern Levant (Garfinkel 1999; Gopher 1995; Gopher and Gophna 1993) had set excellent examples. Moreover, the adoption of pottery has always been considered to be a watershed innovation in a wide breath of theoretical perspectives.

Amongst other reasons is perhaps the fact that pottery took on other meanings for archaeologists. In general, for West Asian prehistorians, when it appeared in quantity pottery became above all a chronological marker, dividing time and assigning the wider realm of material culture to a chronological locker. Ever since Kenyon's excavation of a Neolithic cultural sequence at Jericho in the Southern Levant (Kenyon and Holland 1983), the adoption of pottery in West Asia has marked the crucial culture-historical boundary between an earlier Neolithic stage without pottery and a Late Neolithic, or Pottery Neolithic. In many cases, once the presence of early pottery was noted, it was used to place the site within the right cultural unit and its job was done.

As fundamentally, the Aceramic and Ceramic Neolithic have

generally been treated as being culturally distinct, although this has seldom been made explicit. The earlier Neolithic, perhaps inevitably, has been prioritized in archaeological research, as it is in this stage that the first sedentary villages arose and people first domesticated the plants and animals. Synthesis: The Emergence of Pottery in West Asia that have ever since enabled agricultural economies worldwide. Only more recently the Late Neolithic has emerged as an important field for research in its own right (Akkermans and Schwartz 2003; Nieuwenhuyse et al. 2013).

The two periods are, to a large degree, investigated by different scholarly networks, working with different research questions and meeting at different, specialized conferences. For those interested in early sedentism and domestication, the introduction of pottery represents almost what the coming of Alexander the Great has been for Near Eastern archaeological narratives in general (e.g. Roaf 1990): a good point for ending (e.g. Cauvin 1997). For those interested in the cultural complexities of the Late Neolithic on the other hand, a discourse traditionally dominated by discussions on the Hassuna, Samarra and Halaf cultural traditions (Akkermans 1993; Campbell 1992; Nieuwenhuyse 2007), cultural developments in the later 8th to early 7th millennium cal. BC may be too early to demand attention. Thus while each period has gained much scholarly attention, the boundary between them has remained understudied. It is exactly at this boundary that the sustained adoption of pottery is situated.

Archaeologists working in West Asia perhaps also tend to be rather isolationist. The narrative of changes happening first in West Asia is a repeated one, with the appearance of farming and urban states prime examples. Pottery doesn't fit easily into this scheme, with repeated evidence that it made earlier appearances in East Asia and in North Africa (Gibbs 2015). Understanding it may require a more outward looking perspective than has often been the case.

The group gathering in Tsukuba was not the first to discuss the origins of pottery in ancient West Asia (Tsuneki, this volume, chapter 1). Pottery has always been part of grand meta-narratives: broad universalizing stories about the past and future of mankind. Already in the 19th century social evolutionists speculated, in the virtual absence of any real field data, on the significance and trajectories of early ceramics. For the most part these early scholars adopted a functionalist-adaptionist perspective, which even today is often taken to be so self-evident that it is hardly seen as something deserving explicit discussion. Lewis Henry Morgan (1877) already incorporated the introduction of pottery technology in his grand scheme of human

progress, proposing that this invention marked the transition from what he called 'Lower Barbarism' to 'Middle Barbarism'. Leaving aside the cultural stereotyping implicit in his terminology, Morgan's insight that pottery offered key advantages to those prehistoric societies who came to possess this new technology is still widely accepted today (Arnold 1985; Jordan and Zvelebil 2009).

This became perhaps most explicit in systems theory. Adopting an explicitly processual perspective, Charles Redman (1978) in his great synthesis of West Asian prehistory saw the introduction of pottery as a major positive feed-back mechanism allowing freshly-settled early-agricultural communities to evolve towards truly "economically successful farming villages" (Redman 1978: 106, 179). In the processualist view, these positive feed-backs emerge because pottery allows the storage of surpluses over longer periods of time and permits more efficient processing of food. "One of the more significant innovations was in making containers. ... The introduction of well-fired pottery vessels in the seventh millennium made possible relatively light, watertight, and inexpensive containers... It made the transport and storage of agricultural products easier and more efficient than ever before" (Redman 1978: 179). These functional benefits of pottery allowed human societies to adapt better to their ecological environments and expand the agricultural way of life geographically and demographically. For many scholars, the twin-functions of storage-cum-cooking has remained the primary narrative employed to explain the pristine adoption of pottery in West Asia (e.g. Foster-McCarter 2007; Moore 1995; Rice 1987: 9–10; 1999).

Other scholars have adopted a different perspective towards the adoption of pottery, emphasizing the potential of the new craft for expressing social relationships and symbolic-ideological values. Often associated with female gender roles, the dispersal of the craft and of particular ceramic styles has been explained by changes in marital patterns (e.g. Deetz 1965; Forest 1996, 2013). The adoption of pottery containers has been seen in the context of prestigious feasting in Late Neolithic societies of increasing social complexity (Hayden 1995; Twiss 2008). Pottery was adopted, in this view, to allow agrandizers to compete and to facilitate the distribution of alcoholic beverages at feasts. Searching for ideological transformations paving the way for the expansion of the Neolithic way of life across West Asia and Europe, Ian Hodder (1990) proposed a grand, universalising division in the Neolithic between structured symbolic opposites, which he termed 'agrios' and 'domus'. Whereas the agrios refers to the wild, the outside, and danger, the domus refers to the homely warmth of the

family fireplace, the close kin group. In Hodder's view, pottery firmly belonged in the realms of the domus. Thus we should expect site-contextual associations between early ceramics and hearths, domestic spaces, and every-day household activities. Atalay and Hastorf (2005) suggested that Neolithic farmers added pottery to their household inventory because this allowed those who prepared the everyday meals to gain a free hand. Food could now be left simmering on the fire place with minimum attention, thus allowing the cook to spend time on other activities.

In addition to speculating on the primary social uses or functions of early pottery, western scholarship has always cherished rather firm ideas on the quality of early ceramics: How were early ceramic containers produced and what did they look like? Two key notions implicit in many discussions on early ceramics in West Asia deserve to be made explicit. First, that the earliest pots can only have been primitive, coarsely-made containers, reflecting the 'experimental' character of the craft at its initial stages. Second, that the evolution of prehistoric pottery followed a linear, progressive trajectory. Thus, the first pottery consisted of "homogeneous, coarse, plant-tempered, undecorated pots..." followed several centuries later by "elaborate painted styles and shapes" (Budja 2009: 502). In many accounts pottery is thought to have begun with some accidental 'discovery' or with the innovating insight that elements of the chaîne opératoire of pre-existing crafts could be rearranged to coalesce into pottery production. Following an 'experimental' phase, potentially of long duration, in which people slowly familiarized themselves with plain, coarsely-made pottery, Neolithic communities eventually stepped up and started to make more and more of it, developing increasingly refined products, elaborating the shapes and decorative styles of their containers, and integrating them firmly into their economies. Following its first invention, "Pottery was soon produced throughout the Near East" (Redman 1978: 179).

To be fair, the archaeological record until very recently appeared to confirm the view that pottery began with poorly crafted plain wares (Nishiaki and Le Mièrè, this volume). Even if sound absolute dating remained very problematic for early ceramic complexes, across Upper Mesopotamia coarsely-made plant-tempered wares preceded the introduction of stylistically elaborated wares that characterize the Proto-Hassuna, Hassuna, Samarra and Halaf horizons of the later 7th to early 6th millennium cal. BC (Akkermans 1988, 1993; Campbell 1992; Cauvin 1972; Le Mièrè 1979, 1986; Le Mièrè and Nieuwenhuyse 1996; Lloyd and Safar 1945; Nieuwenhuyse 2000). From 'plain to

painted' (Nieuwenhuyse 2007) seemed an ideal way to summarize the evidence in this sub-region. Moreover, at the sites yielding coarse plant-tempered pottery, this material was present in relatively large numbers already in the early stages, suggesting that it was quickly integrated in the Late Neolithic economy. West Asia evidence corroborated surprisingly well broader archaeological notions of human progress leading from simple to complex. Thus, the humble attempts at primitive clay containers at Mureybet on the Syrian Euphrates (Picon and Le Mièrre 1998), the accidentally fired clay containers of Ganj Dareh in the Zagros (Smith 1968, 1974, 1976) or the pottery found at Kfar Hahoreh (Biton et al. 2014), all dating to deep in the eighth millennium cal. BC, made sense as experimental steps rapidly forgotten, which in the eyes of the earlier investigators did little to pave the way for the subsequent continuous and intensified production of pottery.

Retrospectively, a self-fulfilling reasoning may have been at work. Pre-conceived ideas on the how and why of early ceramics kept archaeologists from searching for field data to confront theoretical expectations with specific real-world contexts. If the Tsukuba conference can achieve only one goal, we suggest it must be an explicit awareness that these long-held ideas no longer work so well. Not only do Synthesis: The Emergence of Pottery in West Asia the theoretical expectations and predictions now face a hard time explaining the exciting data emerging from the field, but these new data also force us to reflect on whether our preconceived ideas were ever really strong.

To be sure, few participants at the conference would disagree that in the very long run the introduction of pottery did have all the implications traditionally ascribed to the craft. With a long term perspective pottery vessels indeed became implicated in an extraordinary variety of tasks, leading to advanced technologies and specialized organization of production. When early urbanites in Mesopotamia built the world's first cities in the fourth millennium, the enabling circumstances incorporated a reliance on pottery. Other craft technologies such as metallurgy or glass became possible only after the invention of pottery (Tsuneki, this volume, chapter 1). The outcome of the conference, however, was an explicit acknowledgement that such long-term benefits were irrelevant to those Neolithic groups who first adopted pottery in West Asia, East Asia or elsewhere. As Brown reminds us (Brown 1989: 602), the reasons for adopting pottery may have been very different from those leading to its subsequent transformations. To understand the adoption

of pottery in West Asia, so discussants emphasized, we should examine the craft on its own terms, within the context of Neolithic societies who made and used these containers.

Rather than replacing earlier meta-narratives with new ones, participants argued, we should be cautious at this stage of proposing new universal views (Bernbeck, this volume). The introduction of pottery containers, contrary to earlier expectations, may not have instigated much cultural change initially. Indeed the communities involved may have resisted such changes, or they may have perceived them to be simply irrelevant (Bernbeck, this volume; Le Mièrre, this volume). The subsequent progress of pottery and its eventual full integration into the Late Neolithic economy, furthermore, seems to have taken many generations. This forces us to rethink the culture-historical boundary between an ‘aceramic’ Neolithic and a ‘Pottery Neolithic’, two fossilized concepts deeply entrenched into prehistoric archaeology in West Asia. The threshold may be much less distinct than we imagined and more challenging to explain. So, how should we conceptualize the role of the earliest pottery in the archaeology of West Asia?

Boundaries in time and place

In recent decades, it had generally become accepted that the adoption of pottery in West Asia happened relatively late in the history of ceramics. Several regions are now believed to have developed pottery significantly earlier. Thus, pottery occurs in Eastern Russia, in China and Japan by 16,500 cal. BC (Craig et al. 2013; Gibbs and Jordan 2013; Lu 2011) and in north Africa it is known in the 10th millennium cal. BC (Huysecom et al. 2009). However, while the East Asian examples in particular do mark chronologically earlier instances, the picture in West Asia is actually rather more complex, in part because of the tyranny of the Aceramic/Ceramic Neolithic chronology.

It is clear that pottery was known in West Asia long before the Ceramic Neolithic, as the examples noted above show. The reason it is not widely recognised may indeed be that this is evidence of repeated reinvention, possibly associated with other crafts such as plaster or accidental firing of unburnt clay objects. The potential for pottery to be utilised was there but did not result in widespread adoption because the social need for ceramics wasn’t yet present. On the one hand, in many ways this interpretation simply explains away the discovery of very early pottery in West Asia. On the other hand, we could argue that it was a regular element of material culture, just one that appears in low numbers and has been neglected simply because

we expect pottery to be an artefact class that occurs in quantity. If we look at a very different class of artefacts, for example figurines, absolute numbers may be not very different but no one would doubt that figurines were a significant artefact category. This has much to do with how archaeologists ascribe value to the objects they find. Pottery is traditionally thought of as a bulk find, heaped in a *zambil* or collected in a bag, rather than a small find, treasured in individual fragments. The techniques for the manufacture of pottery may have been widely known over a wide area including Anatolia, northern Mesopotamia, Iran and the southern Levant for a long period but only employed infrequently and for special items. If the period in which pottery is regularly but rarely found is considered the beginning of pottery in West Asia, it might push the date back to at least 9,000 cal. BC.

One particularly useful outcome of the conference was a synthesis of the currently available radiocarbon dates. Some of them have been available already for some time, but many are fairly recent and had not yet been integrated into a coherent whole (Campbell, this volume). At least we now have a firm idea when communities in West Asia first adopted pottery. We have also reached somewhat firmer ground when it comes to saying where we find early ceramics. If we disregard the various non-pottery items – figurines, unfired clay containers, architecture – shaped of clay and, for the present at least, maintain the convention that pottery in the Aceramic Neolithic doesn't count, we can perhaps look at the date at which pottery became a class of material that was adopted as a continuous technology. The available data suggests that sustained production began around 6900–6850 cal. B.C. in Upper Mesopotamia and the Northern Levant, quite possibly somewhat earlier in Central Anatolia and certainly earlier in Western Iran (Campbell, this volume). Upper Mesopotamia in particular now offers a relatively well-defined Initial Pottery Neolithic horizon. What is perhaps most important about this is not that it gives us the very earliest date but that for the first time we have a region in which pottery adoption can be understood as a sustained process rather than an event. Here the initial or incipient stage, as defined by low densities of well-crafted, mineral-tempered containers, lasted for a few centuries until, between 6600 and 6300 cal. BC, pottery became an ubiquitous artefact appearing in mind-boggling quantities at later 7th-millennium cal. BC sites across Upper Mesopotamia. For convenience sake we may average these estimates to between 7000 and 6600 cal. BC for the incipient stage. Even this misleadingly neat summary brings a host of issues and questions

meriting further work.

For one, as Campbell (this volume) points out, the key period in which pottery first appears coincides with an unhelpful plateau in the calibration curve. Even with further collection of well-stratified radiocarbon dates the boundaries for the start of the Initial phase are likely to continue to be ‘smeared’ along the plateau in the curve unless they come from contexts before 7,000 cal. BC. The result is that currently the incipient phase may have lasted for anything between one and four centuries. Crucial further work certainly lies in the dedicated collection of many more radiocarbon dates but it may only be particularly helpful in defining the boundary between the Initial Pottery Neolithic and the subsequent stages of the Pottery Neolithic.

In terms of human existence, as several participants brought up at the conference, reconstructing the chronological boundaries of the incipient phase will make the crucial difference between a cultural change that occurred over the time span of, say, four generations, in other words quite possibly within living memory, and changes that took place over time spans beyond discursive human experience. Crucially, the adoption of material novelties involves social processes of rejection, acceptance and incorporation – processes that incorporate the dimension of time (Bernbeck, this volume; Lucas 2005; Rogers 1962). The duration we reconstruct for the period discussed at Tsukuba will determine our interpretations of receptivity, changing experiences, expectations and increasing familiarity of Neolithic groups vis à vis novel ways of making containers.

This band of uncertainty almost certainly obscures important micro-histories which, if better understood, would bring us closer to understanding local trajectories of pottery adoption and initial dispersal. A simplistic interpretation might now be that, at some point soon after 7000 cal. BC, pottery was universally adopted by a large number of communities situated within the initial pottery horizon in northern Mesopotamia. This would create an impression that steps toward continuous production of the new craft were being taken simultaneously by closely interacting communities spread across a huge part of the Northern Levant, Central Anatolia, Upper Mesopotamia and western Iran. This model reinforces the apparent geographical boundary between the northern and the southern Levant. The initial dispersal-at-light-speed appears to stop at the present-day border between Syria and Israel with the southern Levant remaining happily aceramic for several centuries (Simmons 2007), although this region had seen much earlier pottery in the PPNB (Biton et al. 2014). Given the different histories of archaeological research on either side

of this current Synthesis: The Emergence of Pottery in West Asia political border, we should be critical of accepting it at face value. An alternative, more subtle interpretation is more plausible, in which we may imagine the new craft spreading slowly, being rejected or accepted in village after village, valley after valley, depending on local circumstances. The apparent disparity between north and south then becomes simply one of a series of regional and sub-regional patterns of adoption.

The papers at the conference offered suggestive hints at several such micro-histories at work. We have seen that the radiocarbon dates of the sequence at Tell Seker al-Aheimar appear to be somewhat out of step with others (Campbell, this volume; Nishiaki and Le Mière, this volume), as do those of Salat Camii Yenı further east. Various local lags and differing tempos of adoption probably need to be envisaged. Ongoing provenance studies suggest intriguing mixtures of local production and imports characterizing early ceramic complexes in northern Syria (Le Mière, this volume). Taking into account the sometimes remarkable similarities between ceramics found at sites situated far apart in northern Syria, this hints at the possibility that pottery production and consumption began earlier at some sites than at others. Might the inhabitants of Tell Sabi Abyad have gained their first experience with pottery containers through their exchange partners from Tell Seker al-Aheimar or vice versa? In the Balikh Valley of northern Syria, furthermore, survey data suggest a partial acceptance of early ceramics, by only those communities that inhabited the northern parts of the valley; those inhabiting the southern parts of the valley apparently declined (Nieuwenhuyse, this volume, chapter 3). In the Northern Levant, notwithstanding the close resemblances between the early ceramics from Shir, Tell el-Kerkh and Yumuktepe, aspects of the vessel typology suggest relative chronologies that perhaps point to a slightly earlier introduction of pottery at Yumuktepe and Tell el-Kerkh than at Shir (Balossi-Restelli, this volume; Odaka, this volume; Nieuwenhuyse, this volume, chapter 8). Might this form the archaeological signature of a slow southward spread of the new craft over the course of a few generations? If so, this may already bring us closer to filling the gap perceived between the early ceramic horizons of the Northern and Southern Levant. Bernbeck (this volume), finally, identifies several micro-trajectories in the Zagros mountains of western Iran.

The chronological boundaries we set for the initial stage of pottery production are relevant for deciding whether or not this stage merits a separate terminology or should rather be seen as a short-lived

transitional stage between two longer, well-defined periods. Mehmet Özdoğan, not present at the workshop but excavating early ceramics at Mezraa Teleilat in southeastern Turkey, favours the second option and proposed the term 'Transitional' for the stage between the PPNB and later PN phases (Özdoğan 2003, 2009). This is not merely a matter of semantics. At stake is our interpretation of the role of pottery containers in West Asia between c.7000 and 6600 cal. BC. If we believe the early stage to have been brief, we may be inclined to interpret the low densities of pottery containers as evidence for a partial rejection of the new craft, until increasing familiarity quickly increased receptivity to the point that the new craft was fully embraced (Bernbeck, this volume). If on the other hand we reconstruct a (much) longer time span for this phase, we should rather accept the low densities of pottery containers as an important aspect of their 'seat in life' during this stage.

Many participants at the conference accepted the possibility that the incipient stage lasted for some three or four centuries. As the group also reached a consensus that the earliest ceramic assemblages in each region that we discussed were qualitatively very different from what came afterwards, several participants proposed terminologies to set this stage apart. Alternatives for the Northern Levant and Upper Mesopotamia include Initial Pottery Neolithic (Nieuwenhuys, this volume, chapter 3), Pre-Proto-Hassuna-First-Phase (Nishiaki and Le Mière, this volume), Ceramic Phase 1 (Cruells et al., this volume; Miyake, this volume) or Rouj 2a (Odaka, this volume).

Not surprisingly, the group reached no consensus with regard to a terminology valid for West Asia as a whole. The lack of consensus in this case was quite deliberate, however. Considering the huge regional variability and the uncertainties of the available radiocarbon dates, none of the participants saw the validity of arguing for pan-regional terminologies for the earliest stages of the Pottery Neolithic. Instead they preferred site-based or, at the most, small-scale regional terminology. Useful examples of regional chronologies include the Rouj (Tsuneki and Miyake 1996, Tsuneki et al. 2007) and the Balikh sequences (Akkermans 1993). Nor did participants suggest that future field work and data collecting will make pan-regional terminology more beneficial: most contributors would not disagree with the working hypothesis that small-scale, localized expressions and inter-regional variability characterized the earliest stages of the Pottery Neolithic in West Asia.

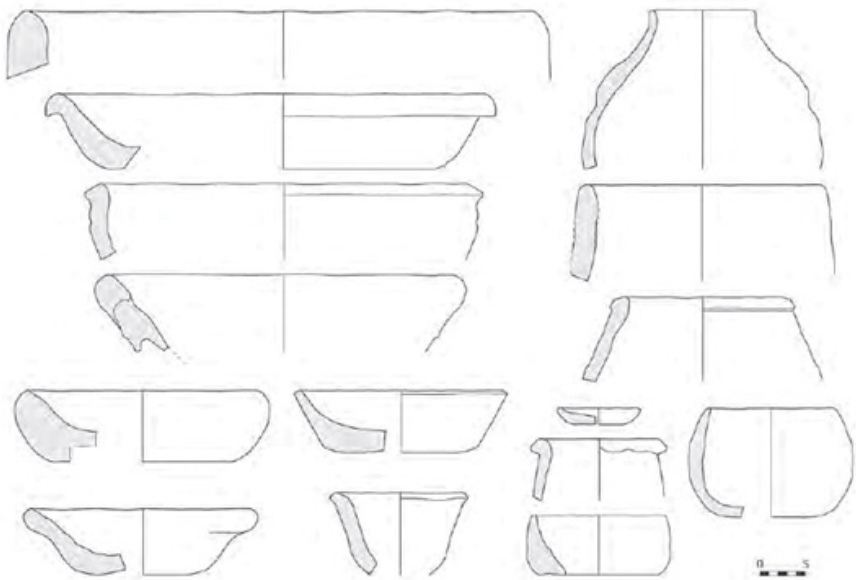


Fig.14.1 The context of Late Neolithic ceramic containers: containers made of gypsum and/or plaster, so-called White Ware (Tell Sabi Abyad).

Materiality and innovation

Considerable discussion at the conference focussed on how the craft of pottery making came about. The discussion ties in with a long tradition of research seeking the conceptual ‘stepping stones’ allowing the craft to emerge (Tsuneki, this volume, chapter 1). The term refers to pre-existing technologies in which elements of the chaîne opératoire happened to overlap with those of pottery making. By selectively re-arranging these elements, so it is thought, Neolithic crafts persons could quickly gain the level of technological expertise needed to start sustained production of ceramic containers.

The archaeology of West Asia offers a rich data set for investigating how specific crafts are embedded in broader cultural contexts, technologies and ideologies, and prehistoric archaeologists have over the years identified a diversity of potential ‘stepping stones’. These include basketry (Childe 1936: 89, Frankfort 1924: 12), making bread (Amiran 1965), clay figurines (Schmandt-Besserat 1977), clay architecture (Budja 2009, Özdoğan 2009), stone vessels (Adams 1983) and, perhaps the most popular of all, containers made of gypsum or lime plaster, the so-called White Ware (Gourdin and Kingery 1975; Goren and Goring-Morris 2009; Kingery et al. 1988; Maréchal 1982; Nilhamn and Koek 2013; Odaka, this volume). Some authors have referred to these diverse technologies and social activities associated

with them as “soft ware technologies” (Rice Synthesis: The Emergence of Pottery in West Asia 1999, Vandiver 1987). The term may sound like the name for a modern rock group or a global company producing office software, but it usefully guides our attention to the common manufacture of containers long before the adoption of pottery.¹ Soft Ware technologies proliferated in the later 8th and 7th millennia cal. BC, providing a dynamic stimulus for the potter’s craft to emerge.

As participants acknowledged, however, many of these stepping stones were deemed self-evident only for as long as the idea held sway that the first pottery in West Asia was coarse, plain and plant-tempered. As we have seen, the meagre archaeological record for the later 8th to early 7th millennium cal. BC in the region has long suggested that the 7th millennium cal. BC coarsely-made, plant-tempered wares were indeed the earliest ceramics to be found. Several conceptual, technological and morphological connections certainly link this coarse pottery with basketry, White Ware, bread and architecture. Attention has been drawn to the importance of these metaphorical links between pottery and a wider world of containers (Knappett et al. 2010). Many of these crafts involve the careful preparation of a soft material by selecting the proper sources, mixing with water and tempering materials to improve workability, shaping the end product by pressing, kneading, sculpting or adding more material. Bread and pisé architecture, like pottery, may involve plant temper. Coarse plant-tempered pottery containers were sometimes shaped while standing on coiled basketry, leaving imprints of woven tissue at the base of the pot (Nieuwenhuyse 2009; Nieuwenhuyse et al. 2012; Berghuijs n.d.). As White Ware containers needed a support during the shaping they were sometimes shaped in pits or baskets; similar shaping techniques existed with the coarse plant-tempered ceramics (Nieuwenhuyse n.d.).

Now that we have come to understand earlier ceramic assemblages characterized by mineral tempers and carefully shaped containers, these crossovers in craft production become less self evident. But some discussion in Tsukuba focused on the potential role of stone vessels. Bernbeck (this volume) draws attention to the seminal work by the Braidwood team at Jarmo in the Zagros piedmont (Adams 1983; Braidwood et al. 1983). At Jarmo stone vessels were partly replaced by pottery containers which specifically filled a niche previously filled by large stone vessels (Adams 1983). Several linkages may be drawn between the earliest pottery now manifested in West Asia and contemporaneous stone bowls. Both involve working with stone, as indicated by the strong mineral tempers typical of the early pottery. In

a sense, the early pottery incorporated stone in its very body. After firing, the carefully smoothed or burnished pottery hardened into a new, artificial material that resembled stone in texture, surface appearance, hardness and durability.

Significantly, the curious style of painting and slipping some of the early ceramic containers in northern Syria, resulting in blurred lines with diffuse edges (e.g. Le Mière, this volume: Fig. 2.6; Nieuwenhuyse, this volume, chapter 3: Figs. 3.5 and 3.6; Nishiaki and Le Mière, this volume: Fig. 5.9: 6) or the enigmatic ‘tadpole’ style from the Zagros sites (Bernbeck, this volume, Figs. 10.3 and 10.8) actually resemble the way Neolithic crafts persons skilfully used the natural colours of stone to create stunning surface colour effects (e.g. Roodenberg 1986). The skilful play with dark-light colour contrasts observed with early ceramics in the Northern Levant (Cruells et al. this volume; Odaka, this volume; Nieuwenhuyse, this volume, chapter 8; Balossi-Restelli, this volume) recalls similar effects with stone vessels such as the black soft stone vessels found already in the PPNA period (Özkaya 2009). In West Asia, furthermore, the earliest pottery containers resemble the contemporaneous stone vessels in shape and size. Both categories of containers were available in small numbers. Were early potters emulating stone vessels? The two categories of containers may have had a comparable ‘seat in life’ (Bernbeck, this volume) in the early stages of the Pottery Neolithic. Future studies may scrutinize the links between the production and consumption of stone bowls and early pottery in West Asia.

What the notion of a ‘stepping stone’ cannot explain is why sustained pottery production began only by the turn of the 8th to the 7th millennium cal. BC. After all, as several participants emphasized, in West Asia the sustained and large scale adoption of pottery appears remarkably late, considering that all these stepping stones had been around for many generations (Özdoğan 2009; Picon and Le Mière 1998; Thissen 2007). However, discussants also pointed out that the unease this ‘delay’ meets in some of the literature may be a cognitive dissonant mostly because of our modernized, western perception, arising from the notion that innovation must be guided by principles of optimal efficiency and adaptation (Bernbeck, this volume). Reinhard Bernbeck (this volume) emphasizes that the search for the first ‘invention’ may be both utterly meaningless and unsolvable because adoption was a process, involving sequential steps over, potentially, a long time scale (also Jordan and Zvelebil 2009: 72–74). Marie Le Mière, too, has repeatedly argued for a sequential development over the *longue durée* (this volume, also Le Mière 2000,

2001; Le Mière and Picon 1987, 1989, 2003). Using then available evidence, she identified a long stage of intermittent experiments with low-fired, plant-tempered containers. The first sustained production of plant-tempered pottery in Upper Mesopotamia initiated the second stage, in turn followed by the spread of pottery production across West Asia (Le Mière and Picon 1989: 10–16). In this model the newly-discovered early mineral-tempered ceramic horizon discussed at the conference would represent an intriguing intermediate stage. Stuart Campbell (this volume), too, distinguishes between a long early phase in which pottery was invented and abandoned repeatedly and a following phase in which sustained production of pottery was adopted.

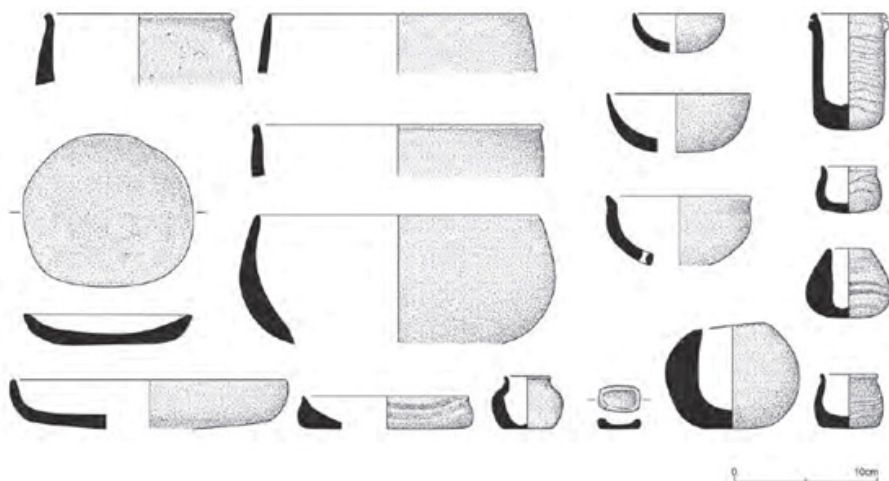


Fig.14.2 The context of Late Neolithic ceramic containers: containers made of stones (Tell Sabi Abyad).

So, participants to the Tsukuba conference were not much troubled by the seemingly delayed appearance of pottery in West Asia. What they emphasized, however, is that this discussion brings home the point that we still must explain why pottery emerged in West Asia when it did and in the pattern it did, rather than several millennia before or afterwards. In the long stage preceding the continuous adoption of pottery, the potential and the knowledge for, and on a very small, intermittent scale the actual practice of, making pottery clearly existed, but it was not exploited at a significant level because the context for its sustained production was not yet there. To fully understand the adoption of pottery, then, we must grasp its broader context. What made the later 8th to mid 7th millennium cal. BC different? What social, economic, demographic or ideological circumstances induced West Asians to exploit the potential that had

laid dormant so long? This debate, we believe, has only just begun.

Contextualizing early ceramics may help pre-empt the search for a single, simple step through which Neolithic peoples might have seen to have finally grasped some broader plan. The idea that early pottery was a happy invention, almost an accident, has a long tradition of thought. Frankfort (1924: 12) and Childe (1936: 89) already argued that pottery was ‘invented’ when clay-lined baskets accidentally caught fire, and this idea has since stuck with the archaeological community (e.g. Gheorgiu 2009). Outside archaeological academic circles, too, the notion of a fortunate invention has been popular. The British potter Dora Lunn (1945: 9) paints an image of a group of primitive people – they did not yet have pottery – socializing around a camp fire chewing uncooked meat and carefully stirring some lukewarm stew in fragile clay-lined baskets. Then, “one day the basket caught fire, and so led to the discovery that whereas the basket perished in the flames, the clay was hardened” (Lunn 1945: 9). The Dutch potter Eppens-van Veen (1963: 7) echoes a similar idea: “After the water evaporated, the clay lining shrunk and came off the basket. So one could remove this clay lining as a roughly-shaped vessel” (Eppens-van Veen 1963: 7).



Fig.14.3 The context of Late Neolithic ceramic containers: containers made of stone, often in various colours and surface textures (Tell Sabi Abyad).



Fig.14.4 The context of Late Neolithic ceramic containers: containers made of unfired clay (Tell Sabi Abyad).

Popular as this long-held image may be, few participants in Tsukuba would accept that such a singular invention led to adoption and sustained production of pottery. Pottery may have been invented, abandoned and reinvented many times before the craft finally settled and expanded (Le Mière, this volume; Campbell, this volume). Bernbeck (this volume) cautions against the notion of ‘invention’ as it brings along unhelpful assumptions regarding the optimal functions of early pottery (see also Lemonnier 1992). The idea of prehistoric potters searching for technical solutions for problems is probably an anachronism, a modern, western concept extrapolated into the past. Rather than deciding on the precise stepping stone, participants asked: Do we really need one? How significant a technological breakthrough was early pottery given the knowledge already widely available? After all, Odaka says (this volume), within the ‘soft ware’ context of the later seventh Millennium in West Asia, pottery made of baked clay was “just another type of container” along with many others made of various materials. Each time pottery was ‘invented’ the ‘experimental’ stage may therefore have been so short as to be invisible archaeologically, or it may have been absent altogether because the knowledge was not actually forgotten but simply not actively

exploited on a large scale.

Alternative approaches to understanding the emergence of pottery chime more closely with the mood of the Tsukuba meeting. Hodder, for example, has recently argued that early pottery should be understood in a range of co-dependent entanglements that it had with other things, including the environment, processes and people (Hodder 2011, 2012). Pottery is not simply an isolated, passive thing, but the product of a series of linked processes. In an approach with echoes of a classic *chaînes opératoire*, a series of stages are involved in procurement of clay, temper and fuel, shaping, firing, distributing, using and discarding. Interactions and entanglements with people, places and things occur at all these stages. Even more recently Gibbs (2015) applies a related approach to understanding the context in which ceramics appeared in West Asia and East Asia. This would see the technologies that enabled pottery making, which existed in West Asia but were not exploited for several millennia, not as simple stepping stones but as stages in growing entanglements between people and things.

From an external perspective, scholars studying the remarkably early adoption of pottery in East Asia (Taniguchi, this volume) and its subsequent dispersal across northern Eurasia have offered an alternative explanation for the long delay (Barnett 2009: 559; Jordan and Zvelebil 2009: 71; Silva et al. 2014). The adoption of pottery in West Asia was delayed because Neolithic groups never invented the craft themselves, in spite of all the stepping stones surrounding them and all the raw materials and advanced technologies known to them. Pottery was first invented in East Asia in the Late Pleistocene, after which the craft slowly dispersed across Northern Eurasian hunter-gatherers. When eventually it reached the Southern Urals (Doluhkanov et al. 2009) it slipped into the existing trading networks carrying obsidian and flint tool technologies into Anatolia and northern Syria. Here the craft met a warm welcome in Neolithic communities, who eagerly adopted the practices of cooking foods and storing agricultural surpluses in their pre-existing Neolithic economies. In this view, in West Asia early Neolithic communities had long before adopted sedentary life and agriculture but without realizing their full potential. Pottery became the technological catalyst unleashing a 'second agricultural revolution' (Barnett 2009: 559), echoing Redman's (1978: 179) proposition that the invention of pottery allowed early farmers to evolve towards economically successful farming communities.

There are significant problems with this suggestion. For this model

to work, it needs to cover the more than 2000 km distance between the Southern Urals and Upper Mesopotamia, filling this huge geographic area with convincing intermediate assemblages. It is true that no signs yet exist that such assemblages exist in north-eastern Turkey or the Southern Caucasus (Le Mière, this volume), largely due to an absence of evidence. However, the 'Eurasian dispersal' model also ignores the huge discrepancies in ceramic technology, vessel shape, decoration and use between the early ceramics from the Southern Ural region (Dolukhanov et al. 2009) and those from Upper Mesopotamia or the Northern Levant. Jordan and Zvelebil (2009: 70–71) suggest Northern Africa as another source of inspiration for the early West Asian pottery, a proposal that meets the same objections as the Eurasian dispersal model.

Participants at the Tsukuba conference, finally, would take issue with the determinist perspective implicit in this diffusionist model. They argue that nothing would have stopped West Asian groups from taking the necessary steps towards sustained production of pottery, had socio-economic and symbolic circumstances called for them to do so (Tsuneki, this volume, chapter 1; Le Mière, this volume). Given the mounting evidence for significant regional variability in the specific technological choices made by early potters, many of the participants would probably accept a multiple origins hypothesis for the adoption of pottery by several interacting regional groups within West Asia, at least as a useful working model to guide further work. An 'internal multiple origins' model does not exclude the possibility of mutual interaction, emulation, rejection or selective cultural borrowing, but it side-steps the difficulties inherent in any singular-source and dispersal model.

The uses of early pots

What did Neolithic peoples in West Asia use their early ceramic containers for? This key issue was hotly debated at the conference. Answering this seemingly simple question may bring us a long way in understanding why pottery was adopted. As Tsuneki (this volume, chapter 1) points out, to move towards this goal, we may fruitfully start by considering the properties of the early ceramic vessels themselves. We have already seen that these properties sit uneasily with long-held ideas that the earliest ceramics in the ancient Near East played a role particularly in food preparation and storage. Participants concluded that the early pottery was quite suitable for cooking, discussed below. Participants in Tsukuba quickly reached a consensus, however, that storage was probably not part of the uses of the earliest

pottery: the small size and open shapes typical for these containers make them unsuitable for efficient storage. Early Pottery Neolithic communities, moreover, had other, pre-existing technologies for storing goods, which they did not readily abandon in favour of some novelty (Tsuneki, this volume, chapter 1; cf. Bartl 2004). In addition a range of alternative uses were suggested on the basis of the pottery containers themselves.

Several discussants remarked on the rather narrow range of shapes attested for the earliest pottery in the 7th millennium cal. BC. No jars are found in the initial stages, nor did vessels gain complex, carinated profiles. Although a few types may be distinguished, basically they are all varieties of bowls or hole mouth bowls (Le Mièrre, this volume). The early vessels are rather small. They are in most cases carefully smoothed and very often burnished: surface finishing techniques that facilitated cleaning and reduced porosity. Well suited for serving and consuming food and drink (Odaka, this volume), they may have figured in commensality either at the scale of the individual household or in larger festivities. In this role they may have had a role in the negotiation of social identities at the scale of the individual household, the village, or even larger collectivities beyond the local community (Balossi-Restelli, this volume).

Stylistic expression almost certainly played a part, at least in some regions. In northern Syria and southeastern Turkey, some of the pottery was deliberately made with light surface colours and painted or slipped with red pigments (Nishiaki and Le Mièrre, this volume; Nieuwenhuyse, this volume, chapter 3; Cruells et al., this volume). In the Iranian Zagros, early vessels were painted with characteristic ‘tadpole’ motifs (Bernbeck, this volume) and in northeastern Iran with red washes (Tsuneki, this volume, chapter 11). In the Northern Levant, decoration in the literal sense of the word seems to be absent from the earliest ceramics. In this region, however, people purposely played around with raw materials and firing strategies in order to create stark differences in light-dark contrasts (Balossi-Restelli, this volume, Nieuwenhuyse, this volume, chapter 8, Odaka, this volume). What connects these various regions, then, is an emphasis on producing objects that we may call visually conspicuous, eye-catching items that stood out from their surroundings and perhaps from alternative materials. This suggests that display was one of the functions of this early pottery: They may have been items meant to be seen. Balossi-Restelli (this volume) argues that colour contrasts were expressly sought to distinguish containers made for food preparation and consumption from those made for storage.

Most interestingly, there is mounting evidence from Upper Mesopotamia that ceramic vessels at this early stage were frequently exchanged. Marie Le Mièrre, who has been collecting provenance data for decades, finds evidence for non-local production or imports at virtually every early Pottery Neolithic site she investigates, even if the exact loci of origin remain to be elucidated (Le Mièrre, this volume). The consistency with which imports are found virtually everywhere suggests that pottery exchange was not limited to specific regional groups or strongly differentiated suppliers and consumers. Early ceramic containers in northern Syria may have been purposely made in order to be circulated from village to village. The small size and, consequently, the limited weight of this pottery would not contradict this. In the Northern Levant, too, Odaka argues (this volume) portability may have been a key aspect of early pottery containers. Provenance studies suggest that the early Dark-Faced Burnished Ware from Shir came to this village from elsewhere (Nieuwenhuys, this volume, chapter 8). Were these containers exchanged as items in their own right or as packages for something else? Exactly how were these exchange networks organized? Did pottery containers travel along the same networks that carried other items such as obsidian, malachite and stone vessels? Did people exchange on a regular basis? Were the ceramic vessels used in particular roles in the same ceremonies that may have accompanied the exchanges? These questions merit much further study.

To these characteristics, we must add the very low quantities in which early pottery containers are found, as many participants remarked. In the initial stages very few pottery vessels were in daily use at any one time. Reinhard Bernbeck (this volume) argued that this signals that in the initial stages receptivity for this novelty was still very low, and Neolithic communities resisted its adoption. Le Mièrre would add that for those communities who did not produce pottery themselves, access to these containers was limited as it depended on the flow of their exchange networks. However, one can also turn the argument around and accept that, in the first few centuries of pottery production and consumption, ceramic containers were, simply, rare artefacts. Depending on the duration one accepts for the initial stage (see above), numbers of vessels in daily use seem to have Synthesis: The Emergence of Pottery in West Asia been kept at a constant low level for several generations. This may suggest that they were not so much resisted or difficult to obtain but rather that Late Neolithic communities preferred this class of artefact to be uncommon. The exclusivity may have been an important part of their function, their

‘seat in life’.

An important methodological remark at this point is that at most archaeological excavations sherd quantities are still exclusively reported in the form of frequencies by number. Participants complained that current impressions of changing amounts of pottery containers in successive archaeological strata can only be stated in qualitative terms: there are ‘more’ or ‘less’ sherds in a specific stratum. We hardly have any firmly quantified grip on such quantities to allow comparison. As has been widely discussed in the archaeological literature, frequency counts on archaeological excavations conflate quantity with the volume of exposures (Bernbeck and Pollock 2003, Pollock 1999, 2013). Many early Pottery Neolithic excavated contexts are small soundings that, logically, produce less material (Özdoğan 2009). The chances of identifying this stage therefore depend much on rather arbitrary decisions for how much is to be excavated. For this crucial intermediate stage between the Aceramic and Pottery Neolithic stages, quantities matter. How they are counted matters too, with much more nuanced use of ways of counting pottery to be encouraged, with sherd densities, minimum vessel counts, vessel equivalent counts and so on to be exploited.

Some participants argued that these various properties of the material support a role of early ceramic containers as prestige items (Cruells et al., this volume). This proposition certainly ties in with broader discussions in the literature that situate the adoption of ceramics in the context of prestigious feasting (Budja 2009; Hayden 1995; Twiss 2008). This proposition was not unanimously accepted at the conference, however. Apart from the properties of the pottery itself, there is little evidence so far to suggest that vying for prestige was of importance in Neolithic societies of this period. Most scholars accept that egalitarian socio-political structures prevailed in this period (Akkermans 2013). Bernbeck (2010) has argued that for ideological reasons Late Neolithic societies in southwestern Iran purposely limited room for the expression of prestige by limiting the scope for pottery elaboration. The rare, novel, exotic and visually conspicuous early pottery containers of West Asia would rather have played their part in largely egalitarian social settings.

Just as modern scholarship feels the urge to discuss these early containers, their properties suggest they would have lent themselves easily to being the topic for discussion in the past. Perhaps they were nothing more or less than a new medium for socializing: something one could sit around with, circulate among family and guests, and talk about. Our own societies offer excellent ethnographic analogues,

known as ‘conversation pieces’. At the symposium, half-jokingly, they were even likened to today’s computers: one reason for their rapid dispersal is that (mostly young) people like to sit with them, use them, talk about them and play with them. The analogue is not as far-fetched as it might seem: as with today’s digital connectivity, the early pottery containers may have ushered new ways of symbolic communication, connecting groups and individuals living far apart.

In the end, participants would probably accept two broad conclusions. First, the various possibilities do not exclude one another. Early pots probably had multiple uses and roles simultaneously. Odaka and Balossi-Restelli most explicitly consider them to have been multifunctional (Balossi-Restelli, this volume; Odaka, this volume); the majority of the participants would not disagree. Indeed we wonder whether diversity itself was a key characteristic. Pottery as a material has the unique advantage that it allows the production of objects fitting in a broad range of contexts, and these contexts can change during the use life of the vessel as it accretes new meanings through time. This flexibility, the propensity to gain multiple functions, may have been one of the key attributes of the early pottery. Even if the range of functional uses was still relatively narrow in the initial stage, the adoption of pottery containers may reflect an enriched materiality in the Late Neolithic. This richer materiality, which also comes to the fore in the broad proliferation of Soft Ware technologies in general, may point to an emerging need for more complex symbolic communication in the later Neolithic. Second, pots alone are not sufficient: if we wish to understand the roles, functions and usages of early pottery containers in West Asia, we need to consider the broader contexts in which they were made and used.

Early pots for cooking

The role of early pottery containers as a cooking ware merits special discussion in any synthesis of the role of early pottery in West Asia. That early pottery vessels should be used for cooking has been a corner stone of most models explaining the adoption of pottery in the region. It finds strong empirical support worldwide: across the globe archaeologists have documented many instances in which pottery containers were first adopted to facilitate the preparation of foodstuffs over a direct fire (e.g. Arnold 1985). In most of these contexts the change to cooking food with pottery had far-reaching socio-economic, demographic and ideological repercussions. A voluminous literature has discussed the importance of cooking in human evolution: softening foods, increasing levels of hygiene, removing toxins,

opening-up otherwise inedible foodstuffs and bringing a rich new sensory experience (Graff and Rodriguez-Alegria 2012; Mee and Renard 2009). So how does this work out when it comes to the emergence of pottery in West Asia?

The group gathered at Tsukuba agreed that the earliest pottery containers presently known in the region could indeed have been used for cooking. Several lines of evidence come together supporting this argument. Foremost, mineral temper acted to prevent cracking caused by rapid heating of the lower part of the pot – so-called thermal shock. While the types of minerals are variable, at many sites they include basalt and crushed calcite, known for their excellent thermal properties (Le Mièrè, this volume; Nieuwenhuys, this volume, chapters 3 and 8; Cruells et al., this volume). The burnishing of the surface helped to make the pottery watertight (Le Mièrè, this volume). The open to slightly closed shapes, frequently with attached lugs for carrying, are characteristic cooking ware shapes (Le Mièrè, this volume). At several sites, finally, ceramic specialists have reported sooting, suggestive of use over a fire (Le Mièrè and Picon 2003; Nieuwenhuys, this volume, chapter 3; Miyake, this volume), although this evidence is not consistently found everywhere (Balossi, this volume; Cruells et al., this volume). We may safely conclude, then, that cooking was among the potential uses of the earliest pottery in West Asia. In our region, however, this is where the story starts to become interesting.

The evidence suggests that far from instigating a wholesale culinary revolution, pot-cooked food and drink did not become a key element of the Neolithic life world until rather later. This is evident from the very limited amounts of pottery vessels in use during the initial stages. The low sherd densities make it clear that only few pots were available in villages at any one time, perhaps less than one per household. Use-analysis suggests relatively high breakage rates for cooking vessels so their regular employment for cooking would inevitably lead to much higher quantities (e.g. Shott 1996; Tani and Longacre 1999). The number of cooking vessels in the archaeological record are certainly insufficient for daily use. There would simply have been not enough cooking vessels to provide a household with cooked food on a daily basis. Similarly, the limited size of the supposedly cooking pots argues against a use in everyday commensality within the routine domestic sphere. This would hardly qualify as a culinary revolution (Balossi-Restelli, this volume). If these containers did indeed function as cooking utensils, this would have involved special events, specific types of foods or drinks, or perhaps

even selected categories of people (Nieuwenhuys, this volume, chapter 3; Campbell, this volume). Food cooked with pots may have carried particular ritual or sacred meanings (Bloch 1985).

Several participants pointed out the striking cultural continuity across the threshold from Aceramic to Pottery Neolithic in other spheres. At several sites excavators were able to demonstrate that some buildings remained in use throughout this transition (Cruells et al, this volume; Nishiaki and Le Mièrre, this volume; Nieuwenhuys, this volume, chapter 3). The lithic industries did not change in tandem with the adoption of pottery (Nishiaki and Le Mièrre, this volume), pointing to continuities in subsistence, craft and social identity. Apart from the regular, albeit still rare, appearance of ceramics, society does not appear very different.

However, across West Asia the ceramic sequences point to a marked change after the initial Pottery Neolithic stage (see below). In Upper Mesopotamia, the earlier mineral-tempered wares apparently went out of use entirely and were replaced primarily by coarsely-made, plant-tempered ceramic types much less suitable for cooking (Le Mièrre, this volume; Nishiaki and Le Mièrre, this volume; Miyake, this volume; Cruells, this volume). In this region, new, specialized cooking wares reappeared at many sites only in the later stages of the seventh millennium. A sustained shift to cooked food, then, was not synchronous with the first adoption of pottery in Upper Mesopotamia (Nieuwenhuys et al. n.d.). In the Northern Levant, too, the earliest mineral-tempered categories ('Kerkh Ware') disappeared. The production of Dark-Faced Burnished Ware continued into subsequent stages, but it became overshadowed by vast amounts of plant-tempered Coarse Ware (Odaka, this volume; Nieuwenhuys, this volume, chapter 8; Balossi-Restelli, this volume).² In the Zagros, too, subsequent ceramic developments were characterized by the development of coarse plant-tempered ceramics (Bernbeck, this volume; Tsuneki, this volume, chapter 11). Thus, across the region, the earlier wares, suitable for cooking, were replaced by ceramic categories much less appropriate for cooking over a fire.

Participants at the workshop struggled with this twist. Marie Le Mièrre perhaps went the farthest in searching for an explanation by proposing what we provisionally term a 'displaced cooking' hypothesis for the adoption of pottery in northern Syria (Le Mièrre, this volume; we emphasize that the author herself does not use this term). In summary, she argues that the need to boil food in pots was not the reason it was first adopted in northern Syria, even if this activity was made possible by the new technology. Taking into consideration the

elaborated, skilful production of the earliest pottery, Le Mière doubts that the move to sustained pottery production was made in the regions in which we now find the earliest ceramics, regardless of the flourishing Soft Ware technologies in the later Pre-Pottery Neolithic. Instead, she argues this 'experimental' phase should be sought elsewhere (Le Mière and Picon 2003). Petrographic work shows that at many sites the mineral inclusions are of volcanic origin, pointing to the Taurus piedmont as a plausible candidate. It is here that we should search for the communities who developed cooking pottery as part of a broader change in their culinary practices. When these precious small containers got a ride on pre-existing exchange networks they eventually reached the northern Syrian steppes and were valued for reasons entirely alien to those who originally had made the pots. They were 'displaced' cooking pots, ending up in foreign places where their suitability as cooking ware did not matter.

Because they did not figure in broader local dietary and economic changes, these early 'cooking vessels' remained an oddity in northern Syria. Late Neolithic communities in northern Syria continued preparing their food and drink as before, using a rich culinary repertoire developed since the early stages of the Neolithic. When for reasons still to be elucidated, exchange networks were disrupted, or local uses for imported containers changed, the early pottery simply disappeared. Northern Syrian groups shifted to making coarsely-made plant-tempered pottery containers in increasing amounts, but the usefulness of this pottery for cooking is contested (Odaka, this volume; Le Mière and Picon 2003). Only several centuries later they 'reinvented' cooking ware technologies and incorporated this new food preparation technology into their economy (Le Mière, this volume).

This model is attractive as it separates first causes from consequences (cf. Brown 1989; Balossi-Restelli, this volume) and leaves much room for regional variability and microhistories. Evidentially, to find full support, it needs to identify a convincing region of origin. Moreover, it needs to show that within this region of origin the adoption of mineral-tempered ceramics came as part of a broader package of change in culinary practices that was not reflected across all of upper Mesopotamia. Together with other Tsukuba participants, Le Mière does not accept diffusion through northern Eurasia as a valid working hypothesis, favouring an independent development of the new craft within West Asia instead (Le Mière, this volume; Le Mière and Picon 1998: 10). In spite of the often poor quality of the archaeological record for this period in West Asia,

however, upper Mesopotamia has a diminishing number of potential unexplored niches in which this region of origin could be located. Although our understanding may change, the archaeological record as we presently know it may favour an independent 'invention' within exactly the regions in which we have currently found the earliest pots.

Finally, there are tantalizing hints at changing culinary practices preceding the adoption of pottery, changes that may have provided an impetus to the adoption of new cooking utensils. At both Tell Halula and Akarcay preliminary insights in faunal butchering practices suggest that people started to boil meaty parts of the carcass in the later PPNB, just before they adopted pottery. The faunal evidence suggests continuity in this regard: the proportions of boiled bones are similar from PPNB to PN (Cruells et al., this volume). At Tell Seker al-Aheimar, a closer look at the lithic industry does point to changes in subsistence. Importantly, however, these did not coincide with the adoption of pottery but began some time earlier in the later Pre-Pottery Neolithic B period (Nishiaki and Le Mière, this volume). Future studies should investigate evidence for these patterns across the region. This preliminary evidence suggests that the communities inhabiting these sites did develop a need for cooking pots which may have facilitated its adoption. Evidentially, however, it does not explain why people abandoned the more efficient new technology so soon after they had adopted it.

Yutaka Miyake, too, argues that cooking formed the primary reason for the invention of pottery containers. Miyake proposes what he calls a 'culinary hypothesis', using his work at Salat Camii Yanı as a case study. At this site many fire pits and hearths were found in the earlier, pre-ceramic phases of the settlement. Cooking at this stage was done with cooking stones. Thick layers of ashes and charcoal attest to the importance of this activity. The use of fire pits and cooking stones continued into later stages at the site, when early mineral-tempered pottery was adopted. They became numerically less important, however, and eventually largely disappeared, as their role in preparing food was taken over by the more advanced ceramic cooking wares (Miyake, this volume). It would be useful to see from Salat Camii Yanı statistics showing exactly what ceramics were available in each phase. Was there continuity in the availability of mineral-tempered cooking wares, or was there a discontinuity, such as observed at Tell Sabi Abyad and other northern Syrian sites? As well, the gradual replacement model still needs to take into account the very low quantities of specialized, mineral-tempered ceramics in the earlier levels. Pottery became available in larger quantities only in

subsequent stages (at Salat Camii Yanı: phase 2) at the same time that the older practices of roasting and pit-boiling disappeared. However, by then it had evolved into coarsely-made plant-tempered pottery, the suitability of which for cooking is far less convincing (Odaka, this volume; Le Mièrè and Picon 2003). Ultimately this also needs tied into our understanding of the chronology of change; if the developments at Salat Camii Yanı happened some time after the appearance and disappearance of pottery at sites further west, as present radiocarbon dates suggests, then this needs to be understood as its own micro-trajectory rather than a universal process.

Others argued that the very same properties that at first sight appear to make the earliest pottery a specialized cooking ware can also have had very different symbolic or functional meanings. Thus, Balossi-Restelli (this volume) reminds us that burnished surfaces do not necessarily imply cooking: they may also have served to increase impermeability of containers made to store or serve liquids. Rather than aspiring to optimal performance during cooking, the early potters at Yumuktepe may have emulated pre-existing container types of basketry or leather to allow the new type of containers to fit cultural expectations (Balossi-Restelli, this volume). Once established for reasons other than cooking, the presence of pottery containers may have subsequently triggered gradual changes in food habits (Balossi-Restelli, this volume), in a manner reminiscent of Le Mièrè's analysis of early pottery in northern Syria (this volume).

Much of the discussion in Tsukuba, in sum, focused explicitly on the physical properties of the early ceramic containers: could people have cooked with them or not? As most of the participants were pottery specialists this conference tended to prioritize typology, chronology, raw materials and optimal performance characteristics. These are important issues, and it is clear that much very fundamental work lies ahead in each of these realms. Participants emphatically emphasized, however, that to fully understand the role of ceramic vessels as cooking vessels in the early stages of the Pottery Neolithic, a narrow focus on pottery alone is insufficient. Future work should broaden the emphasis from cooking as Synthesis: The Emergence of Pottery in West Asia a technology to food ways as a culturally embedded practice. There is a vast anthropological and archaeological literature that situates culinary traditions in ritual practices and the formation of social identities (e.g. Fuller 2005; Mintz and Du Bois 2002). Apart from nutrients and calories a 'culinary revolution' involves new sensory experiences: new smells and flavours, novels forms of commensality and unprecedented opportunities for social display

(Sherratt 1999).

Reinhard Bernbeck pointed out that a shift in cooked food would have involved a new embodiment as people had to adjust to new surroundings that included new types of fragile objects (also Atalay and Hastorf 2005). Thus, the adoption of this new class of material would have stimulated what he calls an 'attitude of care' (Bernbeck, this volume). But precisely because food ways are so steeped in symbolism and cultural tradition, changes in these realms may have been forcefully resisted. In the initial stages of the Pottery Neolithic in West Asia, it may not so much have been the pottery containers that were adopted or rejected but rather the novel ways of eating, drinking and interacting that they represented.

Prospects and challenges

The main question posed at the start of the workshop was when, where, how and why did ceramics first emerge in West Asia? Although the meeting made substantial progress in improving our answers, it is fair to say that it was more significant that progress was made in better defining the questions. A host of areas of very promising future research have become clearer.

The discussion in Tsukuba focussed on the earliest sustained appearance of pottery. It seems clear that there needs to be just as much attention on what came before and what followed. A systematic understanding of the role of containers during the Aceramic Neolithic is certainly required, both to assemble all the data and provide detailed technological understanding. This includes containers made of stone, basketry, bitumen, plaster and, indeed, occasionally of pottery. With the last category, this may clarify whether we are looking at anomalies, multiple independent inventions and reinventions, or evidence of rare but connected production. Equally it is difficult to fully appreciate the origins of pottery in West Asia without also considering subsequent developments. In the mid-7th millennium cal. BC, Neolithic groups shifted to the production of very different kinds of pottery. Although the precise pattern varies, the new pottery was produced in much greater quantities and was less finely made. How is this linked? Was it another reinvention of ceramics, with little continuity with the early 7th millennium cal. BC? Was the earlier production based in socially or geographically restricted knowledge? Did Late Neolithic peoples realize after a while that the heavy, basalt-tempered pottery vessels were not so useful after all (Le Mièvre, this volume)?



Fig.14.5 The context of Late Neolithic ceramic containers: containers made of bitumen-coated basketry (Tell Sabi Abyad).

It can be argued that this subsequent development of ceramics presently represents a new research frontier. In some ways its investigation is more of a challenge than that of the earliest adoption of pottery. As a theme it is definitely less 'sexy', as it is no longer the 'earliest' or the 'oldest'. As a material for study the subsequent stage is definitely aesthetically less attractive. Gone are the exotic early painted sherds, to be replaced by awful quantities of plain coarse sherds. Scholars may be less happy to devote significant resources to this material, and projects less easy to fund.

Yet, as the data emerging from the field suggest, it is in this subsequent stage that pottery containers finally and for the first time became truly integrated in Neolithic societies in West Asia. In the later 7th millennium cal. BC ceramic technologies became more advanced, shapes diversified and pottery containers assumed many of the functions the craft is usually associated with. These included bulk storage and cooking at a much larger scale than before. In the course of the 7th millennium cal. BC, Late Neolithic peoples gradually developed new, collared shapes to facilitate efficient closure; the end result of this development was the introduction of the pottery jar. Jars

are an indispensable component of later 7th millennium cal. BC ceramic assemblages from the Mediterranean to the Iranian Zagros. In the later 7th millennium cal. BC pottery really became part of the Neolithic.

The Tsukuba workshop had a particular focus on northern Mesopotamia and Iran. While this gave it particular strengths, and enabled very real advances in regional understanding, it should also act as a springboard to other regions. Central Anatolia not only has ceramics at Çatalhöyük, possibly at an even earlier date (Cessford 2005; Last 2005), but also examples of pottery deep in the Aceramic Neolithic at Boncukli (Fletcher et al. 2017). Coupled with an additional focus on later developments, the southern Levant, with its delayed adoption of ceramics, needs to be understood as having its own trajectory, perhaps linked to but separate from developments further north. The environmental, cultural and ideological context in which Southern Levantine people eventually adopted pottery at the end of the PPNC phase probably differs from what is observed in these other regions. However, this is probably only one specific instance of what increasingly appears to be a remarkably diverse range of individual paths and contexts to ceramic adoption. It is not necessarily the major anomaly it may have seemed in the past but simply one that we are more aware of at present. Cyprus provides an especially marked, and therefore interesting, example of late adoption of pottery that may provide a particularly strong argument that it is as informative to consider why pottery was not adopted as why it eventually was.

Another major aspect of future research must be concentrated on the material itself – the early ceramic vessels. A range of archaeometrical studies can help understand the technology used to produce the pottery and the potential uses to which it would have been suited. A brief list of properties that we currently know rather little about would include: clay selection, shaping techniques, firing temperatures, porosity, water permeability, strength and Synthesis: The Emergence of Pottery in West Asia thermal behaviour. Equally we should exploit the potential of a range of techniques to understand what vessels were actually used for, including analysis of food residues and traces of use wear.

A further area of scientific research that will be critical to developing our understanding of early ceramic sequences is getting an increasingly firm grip of absolute dating. The value of large numbers of radiocarbon dates from stratified contexts can already be seen. However, this needs to be extended to a greater number of sites.

While the challenge of working with radiocarbon dates in the early 7th millennium cal.BC will remain an issue, information from longer stratigraphic sequence will become increasingly valuable, with approaches that draw on additional data such as length of individual house sequences offering ways of overcoming those issues (cf Hodder and Cessford 2004; Cessford 2005). Alternative dating techniques may even become viable, including Rehydroxylation (RHX) dating of the ceramics themselves (Wilson et al. 2009, 2012).

More data will gradually become available, both from new excavations, and publication and analysis of already excavated material. Several new insights into early 7th millennium cal. BC sequences have already emerged since the Tsukuba meetings (e.g. Campbell and Healey 2012; Nieuwenhuyse n.d.). However, it is also worth noting with unmitigated horror that much of the region that Tsukuba focussed on has become inaccessible for archaeological work due to the unfolding disasters in Iraq and Syria. This is an important reminder that early ceramics research takes place in a real and frequently tragic present that impacts terribly on our colleagues in those countries. Archaeological research never takes place in a vacuum and many of the projects discussed at Tsukuba have seen the devastation of local communities in which they were based. Key sites and reference collections will not survive the current mess unscathed. Clearly this pushes us to cherish the data previously collected from these areas, and study it more intensively while fieldwork is not possible. It encourages us even more to look at the bigger picture in other neighbouring regions.

The question at large, however, can only be tackled by exploring the broader context of Neolithic societies, to reconstruct the socio-economic and symbolic roles ceramic vessels may have had. This is a much more daunting task. Very basic questions concerning social organization, world views and ways of life in the 7th millennium cal. BC remain unanswered. Ceramic specialists will want to work closely together with chemists and biologists to study food residues and the exploitation of specific plants and animals, to gain insights in potential changes, or the lack thereof, in Neolithic food preparation strategies and cuisine. This calls for new types of research projects (Tomkins 2007). If we, as pottery specialists, want to investigate the earliest uses of pottery, we must initiate collaborative projects with botanists, faunal specialists, physical anthropologists, chemical residue analysts and use wear specialists, to ask: what did these people eat? How did they prepare it? Can we empirically identify changes in food preparation? As the Tsukuba group emphasized, ceramic specialists

need to place themselves at the centre of research into the wider Neolithic, rather than simply studying a specific artefact category in isolation.

Finally, perhaps a key insight emerging from the conference is that we must not confuse the reasons for pottery adoption with the long-term consequences. Neolithic peoples in West Asia did not adopt pottery because of the many uses and functions it would gain many centuries later. We still face huge challenges explaining why they adopted pottery, why they did this in the early 7th millennium cal. BC rather than much earlier or much later, or why the earliest ceramic containers looked the way they did. We know that in order to probe these questions we should leave aside long-held views on the why and how of early pottery in the region. We should approach the Neolithic communities who took the step on their own terrain, trying to gain a full understanding of the local contexts in which early ceramic containers were made and used.

Notes

1. The term Soft Ware industries should not be confused with so-called Soft Ware pottery as known from Neolithic Northeast Iran (Tsuneki, this volume, chapter 11).
2. In terms of proportions, at Northern Levantine sites Dark-Faced Burnished Ware became a minority in subsequent stages of the Late Neolithic in assemblages dominated by Coarse Ware. However, these proportions are based on absolute frequency counts of pottery sherds. Future studies should complement these estimates with proportions computed on the basis of sherd densities.

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